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AN INVESTIGATION

OF THE

ROTATION PERIOD OF THE SUN

BY SPECTROSCOPIC METHODS

BY

WALTER S ADAMS

ASSISTED BY JENNIE B LASBY

OBSERVATORY

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INTRODUCTION.

ONE of the earliest of the applications of the Doppler-Fizeau principle in astrophysics was to the problem of the rotation of the sun The detection of the minute displacements of the spectrum lines at the sun's limb by Vogel in 1871 (1)* not only furnished an invaluable proof of the validity of the principle, but also indicated the possibility of obtaining, with the aid of more powerful apparatus, a measure of the rate of rotation by an independent method free from many of the difficulties possessed by such methods as depend upon direct observations of the solar surface The invention of the diffraction grating made it possible to apply to the study of the solar spectrum spectroscopes of much greater power than any previously available, and with its aid Young in 1876 (2) was able to measure the displacements of the spectrum lines at the sun's equator with a considerable degree of accuracy, and to show that the results so obtained were in satisfactory agreement with those derived from observations of the sun-spots. Shortly after, Langley (3) and Cornu (4) made an interesting application of the principle by showing how lines due to the earth's atmosphere may at once be distinguished from those of solar origin by their freedom from displacement when the spectra of the opposite edges of the sun are observed simultaneously.

In 1888 Dunér began at Upsala his celebrated investigation of the rotation of the sun (5) This work, continued throughout 1889 and 1890 and repeated in the years 1901 to 1903, is without doubt the standard of reference among those who have since undertaken the study of this problem Dunér in this investigation made use of the suggestion by Langley already mentioned, and by employing atmospheric lines as his standards of reference was enabled to make all of his measures differential, and so to attain an extraordinarily high degree of precision. His determinations are grouped about points separated by intervals of 15° between the solar equator and 75° of heliographic latitude, a point far beyond the limit reached in sun-spot observations. With the aid of these results he was able to discuss exhaustively the validity of the various formulæ connecting the rotation period with the latitude proposed by Carrington, Faye, and Spoerer as the result of their observations of sun-spots between the equator and 45° of latitude From this discussion he concluded that Faye's formula most closely represented his independent observations in the higher latitudes Many references will be made to this memoir of Dunér in the following pages.

Following Dunér's earlier work some photographic observations were made by Jewell at Baltimore (6), but no details of the results obtained by him have been published In 1887 Crew (7) also took up the problem and obtained a series of values differing widely from those of Dunér It seems probable that some source of systematic error was present in these observations, a possible cause, as Crew himself suggested, being that arising from displacements of the slit due to heating by the sun's image

The most recent investigation was that made by Halm at Edinburgh (8) during the years 1903 to 1906, and led to results of the highest accuracy and importance Like Dunér, Halm made use of the differential method, and since the lines employed by him are the same as those of Dunér, the two series of results are strictly comparable. In two essential features the instruments used by Halm differ from those of most previous investigators The first was in the use of a heliometer to form the solar image, it being possible by movement of the divided object-glass to pass rapidly from one extremity of the solar diameter to the other. The second was in the employment of a fixed horizontal spectroscope in place of an instrument attached to an equatorial telescope and moving with it The advantages of such a type of spectroscope can hardly be questioned, and it was probably mainly due to this cause that Halm's observations showed

* Numbers in parenthesis indicate references to literature on p 132

such a high degree of internal agreement, the probable errors being only about one-half of those of Dunér It was as a result of these observations that Halm concluded a variable period of rotation for the sun, his determinations for separate years showing large systematic deviations from each other In a final paper on the subject (9) he also discussed the later observations of Dunér and arrived at the conclusion that these, like his own, gave evidence of a periodic variation in the sun's rate of rotation The importance of the question thus raised can hardly be overestimated, and it will perhaps be the main consideration in future investigations of this problem

All of the preceding determinations of the rotation period of the sun, with the exception of that of Jewell, have been based on visual observations While it is probable that the photographic method does not possess for such an investigation the overwhelming advantages which it has in the case of faint and difficult spectra, it has certain points of superiority which render an independent determination by its aid of the greatest value Two of these are especially important The visual determinations have been based upon a very limited number of lines in the less refrangible part of the spectrum With the photographic method it is possible to employ a much larger number of lines and to utilize the more refrangible part of the spectrum where the lines are more numerous and the variety of elements which can be employed correspondingly greater These facts were fully realized at the time of the establishment of the Mount Wilson Solar Observatory, and plans were made for taking up a photographic investigation of the rotation period of the sun as soon as suitable instrumental equipment was ready With the completion of the Snow telescope, and the powerful 18-foot spectrograph used in conjunction with it, a combination of apparatus admirably adapted for the work was available, and accordingly in the spring of 1906 the first observations were begun These were continued until June, 1907, after which all observational work on the rotation of the sun was transferred to the tower telescope

Since the investigation was commenced five series of observations have been made and are discussed in the pages which follow Two of these deal with lines selected from the spectrum of the general reversing layer, two with the a line of hydrogen, and the fifth with λ 4227 of calcium The lines of hydrogen and calcium give results differing widely from those obtained for the reversing layer, and so, of course, should be treated individually Moreover, since the two series of determinations for the reversing layer are separated by a considerable interval of time, and the apparatus employed in the second series was entirely different from that in the first, it seems desirable to treat them separately in the present discussion Brief accounts of the main results of these two series of observations have already been published, the first in 1907 (10) and the second in 1909 (11) A detailed account of the observations and reductions follows in Sections 1–10 The discussion and comparison of the results will be considered in Sections 11 20

OBSERVATIONS AND METHODS OF REDUCTION.

1. OBSERVATIONS OF 1906–1907.

THE Snow telescope consists of a cœlostat mirror of 30 inches (76.2 cm) diameter mounted equatorially, which throws a beam of light upon a second plane mirror 24 inches (61.0 cm) in diameter mounted south of it. From this in turn the light passes to a concave mirror of 24 inches aperture and 60 feet (18.3 m) focal length placed at the north end of the telescope house. All of the mirrors are mounted upon masonry piers and are supplied with slow motions, so that the illumination of the concave mirror may be controlled from the cœlostat and the position of the image varied according to the instrument with which it is to be used. The direction of the beam from the second plane mirror to the concave mirror is not horizontal but is inclined at an angle of 5°, owing to the nature of the ground on which the building is placed. For a similar reason the track upon which the second mirror mounting moves does not point north and south but at an angle of 15° to this direction. The cœlostat mirror may be moved east and west upon a track and the second plane mirror north and south (more accurately northeast and southwest) in order to provide for the variation in the sun's declination. The concave mirror can be moved along the direction of the optical axis to allow for focusing of the solar image, and by simple rotation of the mirror the image may be thrown upon any instrument desired. The image formed by the concave mirror has a mean diameter of 6.7 inches (17.0 cm).

The 18-foot (5.5 m) spectrograph used in this investigation and for many other spectrum studies as well, in particular that of the spectra of sun-spots, is placed about 18 inches (45.7 cm) to one side of the optical axis and about 12 inches (30.5 cm) above it, its tube lying directly above the 5-foot spectroheliograph. It is of the Littrow, or auto-collimating, type, with a lens 4 inches (10.2 cm) in diameter used with a plane grating of the same aperture. Both lens and grating are supported on a cast-iron base. The lens is focused by a screw and moves in ways parallel to the optical axis, and may be clamped in any desired position. The grating is mounted in the face of a metal box which rests upon a rotating table, its position being defined by four screws which touch its surface lightly. The original purpose of the metal box was to provide for temperature control, if needed, but in the present investigation the exposures have been so short as to render this unnecessary. Reflections from the surface of the lens are prevented from reaching the plate by a narrow bar placed across the lens, and in addition a system of diaphragms is provided along the tube of the spectrograph. This tube is of wood covered with sheet iron and its central section immediately over the spectroheliograph can be rotated out of place in order to give free access to the prism box of the latter instrument.

The slit and plate-holder are carried by a single large casting, the base of which rests on a masonry pier. The distance between the center of the slit and the center of the plate-holder opening is about 3 inches (7.6 cm), an amount too small to introduce any appreciable astigmatism into the spectrum lines. The plate-holder may be moved up and down by a rack-and-pinion in order to provide for taking several exposures on the same plate. In front of the spectrograph and about 6 inches (15.2 cm) below the slit is a large cast-iron bracket which serves to support the various auxiliary attachments used in conjunction with the spectrograph.

The marked advantages to be derived from photographing the opposite edges of the sun simultaneously, and so doubling the displacements to be observed, led to the employment of a modified form of the device first suggested by Langley. A brass casting with a circular opening about 7 inches (17.8 cm) in diameter carries two brass arms, each of which forms a radius of this opening and rotates about its center. On the outer end of each arm is mounted a small diagonal prism, its mean distance from the center of rotation

corresponding to the mean radius of the sun's image. These prisms are capable of adjustment toward and away from the center in order to allow for variations in the diameter of the sun. At the inner ends of the brass arms and immediately in front of the slit are two other diagonal prisms which receive the beams of light from the first pair. These prisms taper at the end to a width of 0.5 mm, and are mounted with their edges about 0.25 mm apart. The latter distance, accordingly, represents the separation on the photographs of the spectra of the two opposite edges of the sun. At the outer ends of the arms are pointers by means of which readings are made upon a silvered circle concentric with the opening in the brass casting and graduated to half degrees. The whole apparatus is mounted upon the cast-iron bracket already referred to, and its position with reference to the slit is accurately defined by two taper pins which enter the bracket.

The grating which has been used throughout this investigation is one of the earlier Rowland gratings, with ruled surface 3.25 by 1.75 inches (8.3×4.4 cm), and has 14,438 lines to the inch (570 lines to the millimeter). The spectra in the second, third, and fourth orders on one side of the normal are exceptionally bright and the definition is excellent, in spite of the great focal length of the spectrograph. For all of the work on the rotation of the sun with this spectrograph the fourth order has been used, the great linear scale thus obtained being of the utmost value. In this order, at λ 4200, 1 mm = 0.71 Ångstrom.

The importance of accurate adjustment of the spectrograph in a study of small displacements can not be too highly emphasized. In the present investigation the greatest care has had to be taken to guard against unequal illumination of the collimating lens and grating surface by the light from the opposite edges of the sun. It is evident that a small change in the position of the diagonal prisms near the slit would affect this illumination most seriously. Accordingly, before each exposure it has been my practice to occult the images of the two edges in succession and to examine the character of the illumination from each edge. The accuracy of this test has been examined photographically and it has been found to be capable of giving good results when the slit is narrow and the illumination is fairly weak. In addition to this a valuable check upon the accuracy of the adjustment is furnished by the relative density of the pair of spectra on the photographic plates, and no plates have been included in the series used for measurement in which there is any marked difference in the intensity of the spectra of the two edges of the sun. A comparison of the ratio of aperture to focal length in the case of telescope and spectrograph shows that provided the adjustment is reasonably accurate the margin of safety for full illumination of the grating is considerable. In the case of the telescope the ratio is 1 : 30, while in that of the spectrograph for the full aperture of the collimating lens it is 1 : 54, or, for the surface of the grating actually employed, about 1 : 72.

A brief description of the actual procedure followed in taking the plates may be of value. The auxiliary diagonal prism apparatus is placed in position in front of the spectrograph and the image of the sun centered upon it and focused on the slit. The image is then slightly displaced by rotation of the cœlostat mirror, the clock stopped, and the points of transit observed of a spot or other well-defined object on the solar disk across the position circle. Usually several sets of readings have been made and a mean taken. Since the orientation of the image with this form of cœlostat mounting depends upon the position of the second plane mirror on its track as well as upon that of the cœlostat carriage, these observations for a line of reference have been made before each series of plates, and in most cases repeated after the series, especially if the interval covered is at all long. Occasionally the transits have been obtained by rotation of the cœlostat mirror by means of its slow motion, and comparison with the values secured when the image is allowed to drift shows that there is little choice between the two methods. The range of several such determinations usually amounts to about 0°.2 or 0°.3. With the aid of these observations the east-and-west reference line is found and the position of the sun's pole and equator is then readily computed from an auxiliary table, such, for example, as is given in the *Companion to the Observatory*. As soon as the position of the sun's equator is known, the diagonal prisms are set for the latitude desired, the illumination of the grating is examined, and the exposure taken. The second setting upon the position circle is then made and the process repeated. Usually six exposures have been taken upon each plate, although the number

varies according to the latitudes employed. In general, I have used the same plan as that adopted by Dunér of taking points 15° apart between 0° and 75° of latitude, but some intermediate points have also been added, particularly in the higher latitudes when the orientation of the image was especially favorable.

In selecting the region of the spectrum to be employed several considerations have been borne in mind. The use of photographic plates and the desirability of keeping the exposure times as short as possible in order to avoid heating of the slit jaws, as well as changes of focus and astigmatism of the solar image due to changes in the figure of the mirrors arising from prolonged exposure to the sun's heat, naturally led to the employment of the more refrangible part of the spectrum. The fact that the observations of Dunér and Halm were obtained in the less refrangible part also made the use of an independent region most desirable. Although the displacement of the spectrum lines for a given radial velocity is proportional to wave-length and consequently smaller in the violet part of the spectrum than in the red, this disadvantage is fully counteracted by the possibility of employing higher dispersion and fine-grained photographic plates to procure greater linear scale and higher resolution. The plates finally used were Seed's "Process" plates, which give excellent contrast and are appreciably more rapid than lantern-slide plates in the violet part of the spectrum. A second consideration which led to the selection of a region in the violet was the necessity of obtaining the lines of a sufficient variety of elements within the range of wave-length such as could be secured on a single plate. After considerable examination the part of the spectrum between λ 4200 and λ 4300 was selected. The plates employed are very sensitive to this region, and within its limits are found an immense number of lines including a part of the G group, as well as the head of the first violet cyanogen fluting. The presence of the so-called "blue line" of calcium at λ 4227 has also proved of great value in the later observations. The list of lines finally adopted is given in Table 1. The wave-lengths, intensities, and identifications are from Rowland's table.

TABLE 1. — LINES OBSERVED IN 1906–1907.

λ	ELEMENT	INTENSITY.	BEHAVIOR AT LIMB
4196.699	*La*	2	Much weakened
4197.257	*CN*	2	Slightly weakened
4203.730	*Cr*	2	Strengthened and widened
4209.144	*Zr*	1	Weakened
4216.136	*CN*	1	Weakened
4220.509	*Fe*	3	Slightly strengthened and widened
4232.887	*Fe*	2	Much strengthened and widened
4257.815	*Mn*	2	Slightly strengthened and widened
4258.477	*Fe*	2	Much strengthened and widened
4265.418	*Fe*	2	Slightly weakened
4266.081	*Mn*	2	Slightly weakened
4268.915	*Fe*	2	Slightly weakened
4276.836	– *Zr*	2	Weakened
4284.838	*Ni*	1	Slightly weakened
4287.566	*Ti*	1	Slightly strengthened and widened
4288.310	*Ti*, *Fe*	1	Widened
4290.377	*Ti*	2	Slightly weakened. Enhanced line of *Ti*
4290.542	*Fe*	1	Slightly weakened
4291.630	*Fe*	2	Much strengthened
4294.936	*Zr*	2	Probably weakened

The reasons for the selection of the lines in the above list are for the most part self-evident. The lines of cyanogen are included because of the low level at which carbon, and presumably its compounds, lie in the sun's atmosphere, if we may judge from chromospheric observations. The line of lanthanum was selected because of the high atomic weight of this element, and the consequent presumption for a relatively low level,

and the same reason holds in lesser degree for zirconium Iron is represented by seven lines in the list, a number sufficient to eliminate to a great extent possible peculiarities among individual lines when a mean value is taken Titanium is of great interest because of its relatively high level in the chromospheric spectrum, and a larger number of lines would have been desirable in its case The necessity, however, for selecting the lines best suited for measurement, and free from close neighboring lines, has limited the number to three Of these λ 4290 377 is an enhanced line, that is, relatively stronger in the spark spectrum than in that of the arc The other lines belong to elements having an atomic weight close to that of iron

The last column in Table 1 gives the behavior of the lines at the limb of the sun as compared with the center At the time at which the list was selected these remarkable differences in intensity and appearance were not known (12) It was noted on the earliest plates, however, that the lines at the limb as a rule were decidedly broader and more diffuse, as well as in most cases somewhat weaker, than the lines of the ordinary solar spectrum in this region At first this was thought to be due to some instrumental cause, possibly the long path traversed by the light through the glass of the diagonal prisms, but the discovery soon afterward, by Mr Hale and myself, of the essential differences in character of the spectrum of the sun's limb fully explained the difficulty In view of this relative diffuseness of the lines in the immediate neighborhood of the edge of the sun, it seems to me probable that a slightly higher degree of accuracy might be attained in future observations by taking the light from a point somewhat farther within the disk than that which is usually employed, and applying the small corrections needed to reduce to the sun's edge Observations have shown that the spectrum of the limb reverts to the normal solar spectrum very rapidly as the slit is moved away from the sun's edge, and the gain in the sharpness of the lines would probably more than compensate for the small difference in the size of the displacements measured An accurate knowledge of the distance of the slit from the limb would, of course, be essential

2 Record of Observations, 1906–1907

The series of plates employed in this investigation, numbering 44, began in May, 1906, and extended to June, 1907 Between July and October, 1906, no plates were taken, but with the exception of this interval the period is fairly well covered The plates used do not include all which were taken, but careful selection was made with special regard to quality and the conditions under which they were obtained Halm has called attention to the importance of the transparency of the sky in such observations, the effect of a hazy sky, or light cloudiness, being to superpose the spectrum of skylight upon the spectrum from the edge of the sun, and consequently to make the displacements measured systematically too small This point was usually tested visually in the same way as was done by Halm, and a few quantitative determinations of the effect were also made from photographs obtained at a time when the sky was particularly hazy

The record of the observations contained in Table 2 gives the data for the individual plates The estimates of the definition in the fourth column are on a scale of 10 The column headed "Scale concave mirror" refers to the setting of the concave mirror mounting upon its track and is read upon an arbitrary scale Positive readings indicate a direction north from zero, or a greater distance between mirror and slit The considerable variations in these readings are due to the change of figure of the system of mirrors, particularly of the cœlostat mirror, when exposed to the sun's heat This change is dependent upon a variety of conditions, especially the state of the silver surfaces of the mirrors and the temperature of the air surrounding them The column headed "Observations for zero" gives the readings of the points of transit across the position circle of definite points on the sun's disk The method of observing these has been explained previously. The readings of the position circle refer to the settings of the pair of diagonal prisms, and it is from these settings that the latitudes of the observed points on the sun's edge are calculated The numbers following the words "cœlostat" and "second flat" in the column of remarks indicate the positions of these mirrors on their respective tracks The orientation of the sun's image of course is dependent upon these quantities

TABLE 2 —RECORD OF OBSERVATIONS, 1906–1907

Date	Hour G M T	Plate No	Definition	Exposure Time	Slit Width	Scale Concave Mirror	Observations for Zero	Exposure	Readings Position Circle	Remarks
1906	h m			sec	mm		° °		°	
May 3	7 30	ω 3	2	240	0 025	+10	80 2–299 3	1	219 2	Zero very difficult on account of definition
							80 3–300 0	2	234 2	
							94 7–286 0	3	249 2	
							95 1–285 0	4	264 2	
							96 1–284 7	5	279 2	
								6	294 2	
May 8	6 0	ω 6	4	250	0 025	−18	114 5–267 5	1	293 2	
							96 1–286 5	2	278 2	
							114 5–266 8	3	263 2	
							95 6–286 5	4	248 2	
								5	233 2	
								6	218 2	
May 19	10 30	ω 8	5	125	0 025	+252	101 5–281 0	1	302 0	Cœlostat 200
							101 7–280 5	2	297 0	Second Flat 600
								3	285 7	Mirrors resilvered
								4	270 7	Prisms cleaned
								5	255 7	Bars interfere with windows at 300° and at 240°
								6	242 0	
								7	225 7	
June 12	6 45	ω 19	5	45	0 030	+200	100 6–286 0	1	219 3	
							100 3–286 0	2	234 3	
							102 2–284 2	3	249 3	
							104 0–282 5	4	264 3	
							103 6–282 7	5	279 3	
								6	294 3	
June 12	7 15	ω 20	5	60	0 030	+200		1	219 3	
								2	234 3	
								3	249 3	
								4	264 3	
								5	279 3	
								6	294 3	
June 12	7 45	ω 21	5	60	0 030	+300		1	294 3	
								2	278 3	
								3	279 3	
								4	264 3	
								5	249 3	
								6	234 3	
								7	219 3	
June 15	6 0	ω 23	4	65	0 030	+170	102 3–283 8	1	293 0	Cœlostat 300
							103 0–283 2	2	278 0	Second Flat 800
							88 5–298 0	3	263 0	
								4	248 0	
								5	233 0	
								6	218 0	
June 15	6 15	ω 24	3	65	0 030	+150		1	218 0	
								2	233 0	
								3	248 0	
								4	263 0	
								5	278 0	
								6	293 0	
June 15	6 35	ω 25	3	65	0 030	+150		1	293 0	
								2	278 0	
								3	263 0	
								4	248 0	
								5	233 0	
								6	218 0	
June 16	6 20	ω 26	4	65	0 030	+90	102 3–285 3	1	294 7	Cœlostat 400
							105 7–284 5	2	279 7	Second Flat 870
							105 7–284 7	3	264 7	
								4	249 7	
								5	234 7	
								6	219 7	

TABLE 2 — RECORD OF OBSERVATIONS, 1906–1907 — Continued

DATE	HOUR G M T	PLATE No	DEFINITION	EX-POSURE TIME	SLIT WIDTH	SCALE CONCAVE MIRROR	OBSERVATIONS FOR ZERO	EXPOSURE	READINGS POSITION CIRCLE	REMARKS
1906	h m			sec	mm		° °		°	
June 16	7 5	ω 27	3	65	0 030	+90		1	294 7	
								2	279 7	
								3	264 7	
								4	249 7	
								5	234 7	
								6	219 7	
Oct 19	11 10	ω 30	2–3	75	0 030	+260	83 0–293 0	1	72 0	Angles reckoned from B readings on west side position circle
							82 8–293 3	2	87 0	
							82 5–294 0	3	102 0	Cœlostat 112
								4	117 0	Second Flat 300
								5	132 0	
								6	147 0	
Oct 19	12 10	ω 31	2–3	90	0 032	+266		1	147 0	
								2	132 0	
								3	117 0	
								4	102 0	
								5	87 0	
								6	72 0	
Nov 11	10 0	ω 35	4	45	0 032	+400	83 5–275 0	1	141 7	
							83 3–275 3	2	66 7	Zero observations at $6^h\ 0^m$
Nov 11	10 15	ω 36	4	50	0 030	+400		1	66 7	Distance between windows changed to 165 1 mm, between inside edges 83 55 mm
								2	81 7	
								3	96 7	
								4	111 7	
								5	126 7	
								6	141 7	
Nov 11	10 40	ω 37	4	50	0 032	+400		1	141 7	
								2	126 7	
								3	111 7	
								4	96 7	
								5	81 7	
								6	66 7	
Nov 11	11 0	ω 38	4	55	0 032	+400		1	66 7	
								2	81 7	
								3	96 7	
								4	111 7	
								5	126 7	
								6	141 7	
Nov 11	11 15	ω 39	4	60	0 032	+400	80 2–280 0	1	141 7	Zero observations at $11^h\ 30^m$
							79 8–280 3	2	126 7	
							79 5–280 3	3	111 7	
							79 3–280 6	4	96 7	
								5	81 7	
								6	66 7	
Dec 18	5 50	ω 39½	5	60	0 032	+120		1	124 5	
								2	109 5	
								3	94 5	
Dec 18	6 40	ω 40	4–5	70	0 028	+175	90 2–296 5	1	94 5	Cœlostat 858
							90 3–296 0	2	109 5	Second Flat 0
							90 5–296 0	3	124 5	Zero observations at $5^h\ 0^m$ and at $11^h\ 5^m$
							90 6–295 2	4	124 5	
								5	109 5	
								6	94 5	
Dec. 18	6 50	ω 41	5	70	0 025	+140		1	124 5	
								2	109 5	
								3	94 5	
								4	94 5	
								5	109 5	
								6	124 5	

TABLE 2 — RECORD OF OBSERVATIONS, 1906–1907 — Continued

DATE	HOUR G M T	PLATE No	DEFINITION	EX-POSURE TIME	SLIT WIDTH	SCALE CONCAVE MIRROR	OBSERVATIONS FOR ZERO	EXPOSURE	READ-INGS POSITION CIRCLE	REMARKS
1906	h m			sec	mm		° °		°	
Dec 18	10 30	ω 46	4	65	0 030	+150		1 2 3 4 5 6	141 0 126 0 126 0 141 0 141 0 126 0	
Dec 18	10 50	ω 47	4	70	0 030	+150	78 0–282 5 78 3–282 7 102 5–258 5 102 0–258 5	1 2 3 4 5 6	126 0 141 0 133 5 117 0 117 0 133 5	
1907 Feb 3	5 40	ω 50	3–4	70	0 030	+220	105 6–289 5 98 6–296 5 101 7–293 5 102 8–292 3	1 2 3 4 5 6	221 0 230 0 246 0 262 0 277 0 293 0	Zero observations at 4^h 40^m
Feb 15	5 40	ω 55	4	60	0 030	+160	101 0–293 3 95 5–298 5 93 3–300 5 94 0–300 3 96 5–298 0 101 5–292 3	4 5 6	266 0 282 0 297 0	Zero observations at 5^h 0^m
Feb 15	6 5	ω 56	4	55	0 030	+180	94 3– 99 5 95 0– 99 2	1 2 3 4 5 6	218 0 234 0 250 0 266 0 282 0 297 0	
Feb 28	7 15	ω 60	3–4	60	0 030	+250		1 2 3 4 5 6 7	302 0 302 0 288 0 280 3 273 3 264 5 257 5	
Feb 28	7 40	ω 61	3–4	60	0 030	+250	97 0–297 3 82 0–312 3 102 3–291 6 135 7–259 3	1 2 3 4 5 6	248 3 242 3 242 3 248 3 257 5 264 5	Zero observations at 7^h 55^m
Feb 28	9 15	ω 62	3	65	0 030	+250	70 5–298 5 70 7–298 3 91.0–278 5 123 5–246 0	1 2 3 4 5 6	302 0 288 0 280 3 273 3 265 5 257 5	Zero observations at 9^h 30^m
Feb 28	9 45	ω 63	3	65	0 030	+250		1 2 3 4 5 6	251 8 244 8 260 6 267 6 275 2 288 8	
April 7	3 20	ω 64	5	90	0 030	+180	96 3–299 0 99 5–295 7 105 3–289 7 93 0–302 2 105 7–289 5	3	235 0	Zero observations at 0^h 10^m Mirrors badly tarnished

TABLE 2 — RECORD OF OBSERVATIONS, 1906-1907 — Continued

Date	Hour G M T	Plate No	Definition	Exposure time	Slit width	Scale concave mirror	Observations for zero	Exposure	Readings position circle	Remarks
1907	h m			sec	mm		° °		°	
April 7	5 45	ω 67	3	100	0 030	+150		3	235 5	
April 7	6 45	ω 68	3	100	0 030	+150		6	235 5	
April 7	7 10	ω 69	3	100	0 030	+150		1	235 5	
April 22	8 20	ω 81	3	80	0 028	+360	91 5–308 7	1	248 0	Zero observations at 7^h 30^m
							93 5–306 5	2	248 0	
							96 0–304 0	3	242 5	
								4	242 5	
								5	235 0	
								6	235 0	
May 10	10 15	ω 83	3–4	80	0 025	+355	105 0–283 5	1	227 0	Zero observations at 9^h 20^m
							93 3–295 5	2	232 0	
								3	243 0	Distance between inside edges of windows changed to 163 8 mm
								4	243 0	
								5	232 0	
								6	227 0	
May 30	12 5	ω 85	3–4	100	0 022	+356	103 0–285 2	1	220 7	Zero observations at 11^h 40^m
							103 2–285 3	2	225 7	
								3	236 7	
								4	236 7	
								5	225 7	
								6	220 7	
May 31	4 55	ω 86	4	100	0 020	+280	99 3–290 8	1	220 0	Zero observations at 4^h 20^m
							99 7–290 5	2	225 0	
								3	237 0	
								4	256 3	
								5	271 3	
								6	286 3	
June 22	3 10	ω 87	3–4	90	0 030	+400	91 7–279 0	1	223 5	Zero observations at 9^h 55^m
								2	230 5	
								3	230 5	
								4	244 0	
								5	259 5	
								6	274 5	
June 22	11 10	ω 88	3–4	120	0 030	+400		1	274 5	
								2	259 5	
								3	244 0	
								4	230 5	
								5	230 5	
								6	223 5	
June 22	11 40	ω 89	3–4	120	0 030	+400	78 0–294 5	1	223 5	Zero observations at 12^h 30^m
							78 0–294 5	2	230 5	
								3	230 5	
								4	244 0	
								5	259 5	
								6	274 5	
June 23	5 20	ω 90	3	120	0 032	+280	102 7–283 3	1	225 0	Zero observations at 4^h 45^m
							103 0–283 3	2	236 5	
								3	234 0	
								4	252 2	
								5	267 7	
								6	282 7	
June 23	5 20	ω 91	3	120	0 032	+280		1	282 7	
								2	267 7	
								3	252 2	
								4	236 5	

3 METHODS OF MEASUREMENT AND REDUCTION

The series of photographs used in this investigation have been measured upon two comparators, one by Toepfer of Potsdam, with a 150 mm screw, and the other by Gaertner of Chicago, with an 80 mm screw The Toepfer instrument has been used by Miss Lasby of the Computing Division, and the Gaertner machine by myself The screws of both comparators have a pitch of 0 5 mm and have been investigated for periodic errors as well as for errors of run, with results which have proved most satisfactory In the case of the Toepfer instrument, upon which a majority of the plates have been measured, the series of determinations of a fixed distance ruled on a glass plate for every alternate 10 revolutions of the screw between 10 and 280 indicates remarkably small periodic errors At a maximum these amount to 0 3 μ (0 0003 mm), which is considerably below the limit of accuracy of measurement for spectrum plates The reading head of the Toepfer comparator is divided into 100 parts, and so can be read directly to 5 μ, and by estimation to 0 5 μ The errors of run are also small, but of course do not need to be considered in small differential measures of this sort

An examination of the screw of the Gaertner comparator indicates periodic errors amounting at a maximum to 2 μ If this amount entered fully into the value of the displacements it would of course be necessary to apply corrections for it. Since the maximum error, however, applies only to a half-revolution of the screw, that is, 250 μ, while the largest displacements measured (at the sun's equator) are 90 μ, it is evident that only about one-third of the total value can affect the measures Moreover, in reversing the plate for the second series of measures, care has been taken to set the plate in such a way that the opposite part of the revolution of the screw is employed to that used in the first series The effect, accordingly, is to balance the errors in the two cases, and it seems altogether probable that the errors due to the irregularities of the screw with this comparator, as in the case of the larger instrument, fall well below the errors of measurement The reading head of the Gaertner comparator is divided into 500 parts, so that settings can be made directly to 1 μ, and estimations to 0 1 μ, if desired

The procedure followed in measuring the plates is as follows After the plate has been adjusted on the comparator so that the small interval separating the two spectra of the opposite limbs falls at the center of the field of view, and the plate has been carefully lined up for parallelism to the direction of motion of the screw, four settings are made on each line in the two spectra The difference between the means of these settings gives the relative displacements of the lines between the two limbs, or double the displacement due to the rotation of the sun After the whole plate has been measured throughout in this way it is reversed and a similar series of settings made in the second position Since only dark lines are involved, no such systematic differences between the results in the two directions due to physiological causes are found as in the case of spectra in which a comparison spectrum with bright lines is used, but the additional set of measures has proved most useful in correcting peculiarities in the appearance of individual lines, and a higher degree of accuracy, of course, is obtained from this doubling of the number of settings The means of the displacements obtained from the two series of measures are then combined to give the final values The complete measurement in both directions of a plate containing 6 latitudes involves a total of 1920 settings.

A most important consideration in the measurement of the plates is the question of the inclination of the micrometer wire in the eye-piece of the measuring instrument Unless this is accurately parallel to the true direction of the spectrum lines, a considerable error may be introduced into the displacements, since reversal of the plate does not affect the position of the wire in this regard It is evident that the correction could be obtained by making the second measurement through the glass, but the practical objections to this procedure are obvious, and it is probable that small errors might be introduced by refraction in the glass plate Accordingly, the following method was finally adopted A solar spectrum taken with a long slit was obtained at the center of the sun with the direction of the slit parallel to the sun's axis, a position

in which the inclination of the lines evidently would not be affected by the sun's rotation With this plate as a standard the vertical micrometer wire was carefully adjusted until it coincided with the lines of the spectrum throughout their entire length and then clamped in position Since the lines of the rotation spectra are very short (about 1 5 mm for each pair of spectra), it is evident that the accuracy of adjustment for these spectra must be all that can be desired When any change in the inclination of the slit has been made, or the grating rotated about a vertical axis, a new standard plate has been taken and the micrometer wire readjusted This has been done on but one occasion in the present series of observations

After the linear displacements have been obtained in this way the conversion into velocity is effected by the aid of Table 3 The second column gives the factor for conversion of the displacements into Ångstrom units, and the third the value of a displacement of one Ångstrom unit in kilometers for each of the lines measured The last column is the product of the two by the factor one-half, since double the rotational velocity is actually measured It is this column which is used in practice The table is for the Toepfer comparator, for the Gaertner instrument the quantities in the second and fourth columns are twice as large, since the unit of measurement is the millimeter instead of the half-millimeter as in the case of the Toepfer comparator

TABLE 3 — CONVERSION OF DISPLACEMENTS INTO VELOCITIES OBSERVATIONS OF 1906-1907

λ	One revolution in Ångstroms	One Ångstrom in km	One-half revolution in km	λ	One revolution in Ångstroms	One Ångstrom in km	One half revolution in km
4196 699	0 3546	71 45	12 67	4266 081	0 3508	70 29	12 33
4197 257	0 3546	71 44	12 66	4268 915	0 3506	70 24	12 32
4203 730	0 3543	71 33	12 64	4276 836	0 3502	70 11	12 28
4209 144	0 3540	71 24	12 61	4284 836	0 3497	69 98	12 24
4216 136	0 3536	71 12	12 58	4287 566	0 3496	69 91	12 22
4220 509	0 3534	71 05	12 56	4288 310	0 3495	69 92	12 22
4232 887	0 3527	70 84	12 50	4290 377	0 3494	69 89	12 21
4257 815	0 3512	70 43	12 36	4290 540	0 3494	69 89	12 21
4258 477	0 3512	70 42	12 36	4291 630	0 3494	69 87	12 20
4265 418	0 3508	70 30	12 33	4294 936	0 3491	69 82	12 18

The velocities obtained in this manner are those observed directly, and in order to convert them into the velocities corresponding to the sidereal rotation period of the sun it is necessary to apply three corrections The first of these is the small correction for reduction to the edge of the sun, since the slit is always set a small distance inside the limb This is readily found by computation, since the distance of the diagonal prisms which admit the light is accurately known with reference to the center of the sun, and the diameter of the image for any date can be found by the aid of an almanac when the setting of the concave image-forming mirror is known The correction accordingly will always take the form of multiplication by a factor slightly greater than unity A slight allowance has been made for the difference in the size of the solar image at the focus and at the point where the light falls upon the diagonal prisms

The second correction is that for the departure of the sun's pole from its visible edge In this case the correction consists of multiplication by the secant of an auxiliary angle which is designated by η in Dunér's memoir (5a), and for the derivation of which the necessary formulæ have been given by him in full If we put

$\imath$ = inclination of the sun's equator
$\odot$ = longitude of the sun
Ω = longitude of the ascending node of the sun's equator
π = polar distance of the point observed

the formula reads

$$\sin \eta = -\frac{\sin i \sin (\odot - \Omega)}{\sin \pi}$$

In all cases in which the value of η is large the values have been worked out rigorously In the lower latitudes, where the values of η are comparatively small and vary but slightly, use has been made of the convenient table given by Dunér

A third correction is required to allow for the earth's motion in its orbit, or, in other words, to reduce the observed values of the rotation period of the sun to the sidereal rotation period The formulæ necessary for the derivation of this correction have also been worked out completely by Dunér and are given by him in his memoir, together with excellent tables of reference Frequent use has been made of these in reducing the results given here It would of course give the same final values to convert the observed linear velocities into angular velocities and then apply the corrections necessary to allow for the earth's motion directly from the almanac values, and in some ways this procedure would be preferable To facilitate comparisons with other results it has seemed desirable to add the corrections directly to the linear velocities The total value of this correction varies from 0 at the pole to about 0 14 km at the equator

The computation of the heliographic latitudes of the points under observation is made in the following way with the aid of De La Rue's *Tables for Determining the Angle of Position of the Sun's Axis* The position angle of the sun's axis in reference to the north point, as well as the heliographic latitude of the earth, is found for the date of observation, the tables being constructed with the sun's longitude as an argument The position of the north point is found in the way already explained by transits of the sun's disk across the position circle of the instrument Accordingly, if

p = position angle of point from sun's north point
P = angle of sun's pole from north point
D = earth's heliographic latitude

the heliographic latitude ϕ of the point desired is found by the formula

$$\sin \phi = \cos (p - P) \cos D$$

The polar distance π is, of course, the complement of the angle ϕ

4 Sources of Error

As in all quantitative investigations of the displacements of spectrum lines, the errors in the results obtained in the present study naturally fall under two heads Under the first are those due to instrumental causes, leading to errors in the values of the displacements on the plates Under the second fall errors arising from the measurement of the plates and the reduction of the results obtained There can be little doubt that of these two the first is by far the more serious, since errors of this sort are much more liable to be of a systematic character than those arising from either measurement or reduction

The principal sources of error to be considered under the first head are as follows

(1) Astigmatism, changes of focus, and lack of definition of the solar image

(2) Heating of the slit jaws during exposures

(3) Unequal illumination of the grating from the opposite edges of the sun

(4) The presence of the spectrum of skylight, which tends to reduce the values of the displacements observed

I have already discussed (3) and (4) in a preceding paragraph and described the precautions taken to avoid the introduction of error from them It seems probable that any difficulty due to the presence of the skylight spectrum can hardly be appreciable when the plates used for measurement have been selected

from those taken on especially transparent days Experiments made by Mr Hale and myself (13) have indicated that on a day of average transparency on Mount Wilson the brightness of the sky spectrum close to the edge of the sun is about one-fortieth that of the spectrum inside the limb Accordingly, this would represent about the maximum effect in the case of the plates under consideration, and a contribution of one-fortieth to the intensity of the spectrum lines would probably be entirely inappreciable both in the appearance of the plates and in the measurement The influence of inequalities in the illumination of the grating can probably never be absolutely eliminated, but with the aid of the precautions taken in securing the exposures I feel confident that the effect has been reduced to a minimum, and that in an extended series of observations the residual effect can be regarded mainly as an accidental error which will tend to eliminate itself with a sufficient number of plates

The question of the heating of the slit jaws during the exposures has been treated with especial care, since errors arising from this source have been encountered by other observers On account of the comparatively small ratio of 1 30 between aperture and focal length in the Snow telescope, and the relatively large image employed, the amount of heat which falls upon the slit is of course much less than in the case of relatively short focus telescopes Additional advantages are the silvering of the slit jaws, which helps to reflect the heat that falls upon them, and the fact that a length of only about 3 mm of the slit is exposed to the sun when the plate is taken In order to obtain a definite test, however, I have tried several exposures upon the same part of the sun, using a comparison spectrum obtained with and without the interposition of a glass cell containing a thickness of 20 mm of water Such a screen could hardly fail practically to eliminate heat effects on the slit The measurement of these plates has indicated no difference whatsoever between the results obtained with and without the screen, and the conclusion seems to be warranted that any effect upon the rotation values due to heating of the slit jaws during the exposures must be very small

The first source of error referred to in the list, which has to do with the astigmatism and lack of definition of the sun's image upon the slit of the spectrograph, is perhaps the most serious of any encountered in the investigation In working with the Snow telescope we have found that the definition of the solar image toward the middle of the day is much inferior to what it is in the early morning and late afternoon, and that the effect of prolonged exposure of the mirrors to sunlight at this time of day is to introduce a considerable amount of astigmatism due to changes of figure of the plane mirrors This shows itself in a distortion of the image and a difference of focus between the vertical and horizontal diameters The effect of this upon determinations of rotation is to introduce into the slit additional light from points differing slightly in latitude from those upon which the diagonal prisms are set, and also to cause a slight difference for different latitudes in the distance from the sun's edge at which the light is taken The first is probably much the more serious The effect of changes of focus during the exposures is also in the direction of bringing into the slit scattered light from other latitudes than those upon which the instrument is set, and the same holds true of most defects in the character of the sun's image

Since the plates for the determination of the rotation of the sun have been taken for the most part toward the middle of the day, the early morning hours and the late afternoon being utilized for the spectroheliograph, the effects discussed here must have influenced the results obtained to a certain extent The selection of the plates to be used for measurement, however, and the rejection of those which were obtained under especially unfavorable conditions, must have rendered decidedly less the amount of the error from this source which can enter into the determinations In taking the plates it has been found possible to reduce materially the amount of astigmatism and variation of focus by keeping the mirrors cooled by a circulation of air about them from electric fans, and by shutting off the sunlight for short intervals between the successive exposures on the plate It is evident that even in the case of a poorly defined image the main effect of the introduction into the slit of the scattered light from points bordering on the latitudes employed will be to widen the lines without altering the displacements seriously, since in general the foreign light will come from regions distributed symmetrically about these points of latitude In the

case, however, of a marked change in the character of the image during the exposures on the various latitudes, systematic errors might be introduced, and such effects would naturally be greater in the higher latitudes, where the change of velocity with the latitude is more rapid than it is near the equator It is of course impossible to say to what extent these effects may have entered, and I can only emphasize the fact that all the precautions which have seemed feasible have been taken to keep the character of the image the same during the series of exposures

A consideration of the second class of errors which may influence these results, those that arise from errors of measurement and reduction, may be passed over rapidly The methods of measurement and the screw errors affecting the instruments employed have already been discussed in full, and it seems probable that there can be but little systematic error due to this source affecting the results In the reductions, moreover, methods rigorous within the limits of accuracy required have been followed, and consequently there is little to be feared from this source except as regards numerical errors of computation To avoid the latter a considerable part of the work has been done in duplicate, especially that involving the various corrections to the observed velocities and the computation of the latitudes The conversion of the measured displacements into velocities is readily checked by comparison with a standard table

In conclusion it should be noted that small absolute errors may be introduced into the results by uncertainty in the values of the constants of reduction employed Throughout the observations of 1906–1907 the following values, by Carrington, of the inclination of the sun's equator i and the longitude of its ascending node Ω have been used

$$i = 7^\circ\ 15' \qquad \Omega = 74^\circ\ 24'\ (1906)$$

In concluding this discussion of the sources of error in the observations, reference should be made to a class of phenomena present in the sun which under certain conditions may very seriously affect the results obtained for the rotation These are the disturbances in the solar atmosphere which have been discussed recently under the term "Solar Vortices" (14), although their character is as yet by no means clear The influence of the presence of such disturbances will be referred to more fully in connection with the consideration of the series of observations of 1908, and some numerical results will be given at that time It is sufficient to call attention here to the fact that these solar storms sometimes affect very large regions of the sun's surface, and that throughout these regions the velocities due to the rotation of the sun may be greatly modified by the proper motions of the areas involved

5 Results for the Individual Plates, 1906–1907

The detailed results for the separate plates used in this investigation are given in Table 4 The main consideration borne in mind in the construction of this table has been to give all the data essential to an independent computation of the values derived from the plates With this in view, at the beginning of the summary for each plate are given the constants used in the reduction of that plate, together with the necessary data for the computation of the latitudes and the auxiliary angles employed in correcting the observed values Although most of the symbols have already been defined, for the sake of convenience it may be well to repeat them at this point

$\odot$ = longitude of sun
Ω = longitude ascending node of sun's equator = $74^\circ\!.4$ for 1906
P = angle between sun's pole and north point.
D = earth's heliographic latitude
π = heliographic polar distance of point observed = $90^\circ - \phi$
η = angle made by the plane passing through the point observed, the sun's pole, and its center, with the plane corresponding to the sun's visible edge

The diameter of the image is found by computation in the way already described from the almanac value of the sun's angular semi-diameter combined with the concave mirror setting of the Snow telescope The "factor" referred to is the semi-diameter divided by one-half the distance between the diagonal prism openings which admit the light to the slit

The results for the individual lines of each plate for the various latitudes are given immediately below the constants for the plate The values of Δ are the mean total displacements expressed in half-millimeters Hence the largest displacements measured are about 0 075 mm In the case of plates measured with the Gaertner comparator the values of the displacements have been multiplied by two, in order to make all of the quantities given homogeneous The meaning of the other symbols employed in the tables is as follows

v = linear velocity corresponding to the sun's synodic period of rotation
v_1 = correction for reduction to sidereal period of rotation
ξ = daily angular velocity corresponding to the sidereal period of rotation

It is evident from the consideration of the methods of reduction that

$$v = \Delta \times \left\{ \begin{matrix} \text{Value one-half revolution} \\ \text{of micrometer in km} \end{matrix} \right\} \times \text{Factor} \times \sec \eta$$

The values of the second quantity are obtained from the last column of Table 3 The corrections v_1 are from the tables of Dunér (5) The value of ξ is readily found from $v + v_1$ by means of the formula

$$\xi = \frac{N(v + v_1)}{2\pi R \cos \phi} 360^\circ = [0\ 851228]\ \frac{v + v_1}{\cos \phi}$$

where N is the number of seconds in a mean solar day and R is the sun's radius in kilometers

Some of the values for the individual plates given in Table 4 differ to a certain extent from those which appeared in an earlier communication (10) This is due mainly to the inclusion of a number of measures of plates by myself which I have found an opportunity to make in the interval since the first publication As a consequence the mean values obtained represent much more nearly the average values for the two observers, Miss Lasby and myself, than did the earlier results The values given here should accordingly be more nearly free from systematic peculiarities of measurement There are also a few changes due to revision of the constants applied for correction of the observed velocities, particularly of the constant of reduction to the sidereal period of rotation The final effect of all such changes on the mean values, however, is very small, the largest difference in the mean for any normal place amounting to about 0 005 km In the table the abbreviations L and A refer to Miss Lasby and myself, while the two comparators used, the Toepfer and Gaertner instruments, are designated by T and G respectively

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907

Plate ω 3 1906, May 3, 7^h 30^m G M T Measured by L on T Distance from Limb 2 4 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	42 4	5 2	6 4	83 6	36 9	1 250
O − Ω	− 32 0	20 2	20 5	69 5	11 0	1 019
P	23 9	35 2	35 4	54 6	6 6	1 007
D	− 3 8	50 2	50 3	39 7	5 0	1 004
Diameter	172 0 mm	65 2	65 3	24 7	4 2	1 003
Factor	1 028	80 2	80 2	9 8	3 9	1 002

λ	ϕ = 9°8				ϕ = 24°7				ϕ = 39°7			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 145	1 891	2 027	14 61	0 127	1 658	1 787	13 96	0 098	1 282	1 395	12 87
4197 257	0 145	1 891	2 027	14 61	0 128	1 670	1 799	14 06	0 100	1 305	1 418	13 08
4203 730	0 146	1 896	2 032	14 64	0 130	1 692	1 821	14 23	0 100	1 303	1 416	13 06
4209 144	0 146	1 890	2 026	14 60	0 132	1 714	1 843	14 40	0 102	1 327	1 440	13 29
4216 136	0 146	1 887	2 023	14 58	0 129	1 672	1 801	14 07	0 100	1 297	1 410	13 01
4220 509	0 145	1 875	2 011	14 49	0 131	1 694	1 824	14 35	0 102	1 315	1 428	13 18
4232 887	0 147	1 892	2 028	14 62	0 132	1 699	1 828	14 28	0 101	1 302	1 415	13 06
4257 815	0 149	1 900	2 036	14 67	0 133	1 696	1 825	14 26	0 104	1 331	1 444	13 32
4258 477	0 149	1 896	2 032	14 64	0 132	1 680	1 809	14 14	0 103	1 312	1 425	13 15
4265 418	0 147	1 865	2 001	14 42	0 132	1 674	1 803	14 09	0 104	1 321	1 434	13 23
4266 081	0 149	1 886	2 022	14 57	0 133	1 685	1 814	14 18	0 103	1 305	1 418	13 08
4268 915	0 148	1 874	2 010	14 48	0 132	1 672	1 801	14 07	0 102	1 295	1 408	12 99
4276 836	0 146	1 848	1 984	14 30	0 131	1 659	1 788	13 97	0 103	1 305	1 418	13 08
4284 838	0 147	1 855	1 991	14 35	0 132	1 670	1 799	14 06	0 102	1 293	1 406	12 97
4287 566	0 147	1 855	1 991	14 35	0 132	1 668	1 797	14 04	0 103	1 305	1 418	13 08
4288 310	0 148	1 865	2 001	14 42	0 132	1 666	1 795	14 03	0 104	1 315	1 428	13 18
4290 377	0 147	1 852	1 988	14 33	0 130	1 641	1 770	13 83	0 104	1 313	1 426	13 16
4290 542	0 148	1 863	1 999	14 41	0 134	1 686	1 815	14 18	0 102	1 288	1 401	12 93
4291 630	0 148	1 862	1 998	14 40	0 132	1 662	1 791	14 00	0 104	1 312	1 425	13 15
4294 936	0 148	1 861	1 997	14 39	0 133	1 673	1 802	14 08	0 104	1 311	1 424	13 14

λ	ϕ = 54°6				ϕ = 69°5				ϕ = 83°6			
4196 699	0 068	0 892	0 981	12 02	0 038	0 504	0 564	11 43	0 008	0 132	0 160	10 19
4197 257	0 069	0 904	0 993	12 17	0 037	0 493	0 553	11 21	0 009	0 146	0 174	11 08
4203 730	0 070	0 916	1 005	12 32	0 041	0 543	0 603	12 22	0 009	0 145	0 173	11 02
4209 144	0 070	0 914	1 003	12 29	0 041	0 541	0 601	12 18	0 008	0 131	0 159	10 13
4216 136	0 069	0 901	0 990	12 13	0 040	0 527	0 587	11 90	0 009	0 145	0 173	11 02
4220 509	0 070	0 909	0 998	12 23	0 041	0 542	0 602	12 20	0 010	0 161	0 189	12 04
4232 887	0 070	0 901	0 990	12 13	0 041	0 539	0 599	12 14	0 010	0 161	0 189	12 04
4257 815	0 071	0 909	0 998	12 23	0 043	0 557	0 617	12 51	0 012	0 189	0 217	13 82
4258 477	0 072	0 919	1 008	12 35	0 042	0 544	0 604	12 24	0 010	0 159	0 187	11 91
4265 418	0 073	0 933	1 022	12 53	0 042	0 544	0 604	12 24	0 011	0 175	0 203	12 93
4266 081	0 073	0 932	1 021	12 51	0 043	0 553	0 613	12 43	0 012	0 189	0 217	13 82
4268 915	0 073	0 929	1 018	12 48	0 043	0 553	0 613	12 43	0 011	0 174	0 202	12 87
4276 836	0 072	0 915	1 004	12 30	0 042	0 541	0 601	12 18	0 010	0 159	0 187	11 91
4284 838	0 072	0 915	1 004	12 30	0 042	0 543	0 603	12 22	0 011	0 176	0 204	12 99
4287 566	0 072	0 913	1 002	12 28	0 042	0 542	0 602	12 20	0 012	0 190	0 218	13 88
4288 310	0 074	0 938	1 027	12 59	0 042	0 541	0 601	12 18	0 010	0 158	0 186	11 85
4290 377	0 073	0 925	1 014	12 43	0 042	0 541	0 601	12 18	0 011	0 174	0 202	12 87
4290 542	0 072	0 911	1 000	12 26	0 042	0 540	0 600	12 16	0 011	0 174	0 202	12 87
4291 630	0 072	0 911	1 000	12 26	0 041	0 526	0 586	11 88	0 011	0 173	0 201	12 80
4294 936	0 073	0 922	1 011	12 39	0 043	0 550	0 610	12 37	0 010	0 158	0 186	11 85

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 6 1906, May 8, 6h 0m G M T Measured by L on T Distance from Limb 2 4 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	47 2	4 3	5 4	84 6	37 8	1 266
O − Ω	−27 2	19 3	19 6	70 4	9 9	1 015
P	22 9	34 3	34 4	55 6	5 9	1 005
D	−3 3	49 3	49 4	40 6	4 4	1 003
Diameter	172 1 mm	64 3	64 3	25 7	3 7	1 002
Factor	1 028	79 3	79 3	10 7	3 4	1 002

λ	φ = 10°7				φ = 25°7				φ = 40°6			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 146	1 902	2 038	14 73	0 128	1 670	1 798	14 17	0 097	1 266	1 378	12 88
4197 257	0 146	1 894	2 030	14 67	0 130	1 682	1 810	14 26	0 099	1 288	1 400	13 09
4203 730	0 147	1 904	2 040	14 74	0 130	1 680	1 808	14 25	0 098	1 273	1 385	12 95
4209 144	0 146	1 889	2 025	14 63	0 127	1 644	1 772	13 96	0 097	1 264	1 376	12 87
4216 136	0 148	1 908	2 044	14 77	0 130	1 677	1 805	14 22	0 098	1 270	1 382	12 92
4220 509	0 148	1 903	2 039	14 73	0 130	1 674	1 802	14 20	0 101	1 301	1 415	13 21
4232 887	0 151	1 920	2 056	14 85	0 132	1 680	1 808	14 25	0 102	1 301	1 415	13 21
4257 815	0 150	1 906	2 042	14 75	0 130	1 658	1 786	14 07	0 101	1 285	1 395	13 04
4258 477	0 149	1 892	2 028	14 65	0 130	1 655	1 783	14 05	0 102	1 295	1 407	13 16
4265 418	0 151	1 912	2 048	14 80	0 131	1 664	1 792	14 12	0 102	1 294	1 406	13 15
4266 081	0 151	1 910	2 046	14 78	0 130	1 652	1 780	14 02	0 102	1 292	1 404	13 13
4268 915	0 151	1 908	2 044	14 77	0 132	1 671	1 799	14 17	0 101	1 279	1 391	13 01
4276 836	0 150	1 896	2 032	14 68	0 131	1 658	1 786	14 07	0 102	1 291	1 405	13 12
4284 838	0 150	1 893	2 029	14 66	0 132	1 665	1 793	14 13	0 101	1 278	1 390	13 00
4287 566	0 151	1 903	2 039	14 73	0 131	1 654	1 782	14 04	0 102	1 289	1 401	13 10
4288 310	0 150	1 890	2 026	14 64	0 133	1 675	1 803	14 20	0 101	1 276	1 388	12 98
4290 377	0 150	1 887	2 023	14 62	0 131	1 650	1 778	14 01	0 102	1 287	1 399	13 08
4290 542	0 150	1 886	2 022	14 61	0 132	1 662	1 790	14 10	0 102	1 285	1 397	13 06
4291 630	0 150	1 886	2 022	14 61	0 132	1 662	1 790	14 10	0 102	1 284	1 396	13 05
4294 936												

λ	φ = 55°6				φ = 70°4				φ = 84°6			
									0 009	0 153	0 180	13 58
4196 699	0 068	0 890	0 978	12 29	0 039	0 516	0 574	12 15	0 008	0 158	0 165	12 45
4197 257	0 068	0 887	0 975	12 25	0 039	0 514	0 572	12 10	0 010	0 158	0 185	13 96
4203 730	0 067	0 873	0 961	12 08	0 040	0 527	0 585	12 38	0 009	0 154	0 181	13 65
4209 144	0 068	0 883	0 971	12 20	0 038	0 500	0 558	11 81	0 008	0 132	0 159	11 99
4216 136	0 070	0 905	0 993	12 48	0 040	0 524	0 582	12 32	0 011	0 178	0 205	15 46
4220 509	0 069	0 890	0 978	12 29	0 040	0 523	0 581	12 30	0 009	0 151	0 178	13 43
4232 887	0 072	0 919	1 007	12 65	0 042	0 541	0 599	12 68	0 010	0 155	0 182	13 73
4257 815	0 070	0 896	0 984	12 37	0 042	0 540	0 598	12 66	0 010	0 161	0 188	14 18
4258 477	0 071	0 904	0 992	12 46	0 041	0 528	0 586	12 40	0 009	0 148	0 175	13 20
4265 418	0 072	0 916	1 004	12 62	0 042	0 539	0 597	12 63	0 011	0 171	0 198	14 94
4266 081	0 072	0 915	1 003	12 60	0 042	0 539	0 597	12 63	0 008	0 134	0 161	12 14
4268 915	0 072	0 914	1 002	12 59	0 041	0 528	0 586	12 40	0 009	0 148	0 175	13 20
4276 836	0 071	0 900	0 988	12 42	0 041	0 526	0 584	12 36	0 010	0 166	0 193	14 56
4284 838	0 072	0 912	1 000	12 57	0 042	0 538	0 596	12 61	0 009	0 147	0 174	13 13
4287 566	0 071	0 898	0 986	12 39	0 041	0 526	0 584	12 36	0 010	0 153	0 180	13 58
4288 310	0 072	0 910	0 998	12 54	0 041	0 525	0 583	12 34	0 009	0 139	0 166	12 52
4290 377	0 072	0 909	0 997	12 53	0 044	0 560	0 618	13 08	0 009	0 145	0 172	12 98
4290 542	0 072	0 909	0 997	12 53	0 043	0 548	0 606	12 83	0 008	0 128	0 155	11 69
4291 630	0 072	0 909	0 997	12 53	0 043	0 547	0 605	12 80	0 010	0 150	0 177	13 35
4294 936												

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 8 1906, May 19, 10h 30m G M T Measured by A on G Distance from Limb 2 3 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
⊙	58 0	14 6	14 7	75 3	8 1	1 010
⊙−☊	−16 4	30 9	31 0	59 0	4 0	1 002
P	19 9	44 6	44 6	45 4	2 9	1 001
D	−2 0	59 6	59 6	30 4	2 4	1 001
Diameter	179 2 mm	74 6	74 6	15 4	2 1	1 001
Factor	1 028	90 9	89 1	0 9	2 0	1 001

λ	$\phi = 0°9$				$\phi = 15°4$				$\phi = 30°4$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 144	1 877	2 016	14 31	0 136	1 767	1 901	14 01	0 116	1 518	1 642	13 52
4197 257	0 150	1 951	2 090	14 84	0 142	1 858	1 992	14 68	0 116	1 521	1 645	13 54
4203 730												
4209 144	0 154	2 010	2 149	15 26	0 138	1 779	1 913	14 10	0 116	1 517	1 641	13 51
4216 136	0 144	1 865	2 004	14 23	0 136	1 773	1 907	14 06	0 120	1 561	1 685	13 87
4220 509	0 150	1 944	2 083	14 79	0 140	1 852	1 986	14 64	0 122	1 574	1 698	13 98
4232 887	0 152	1 963	2 102	14 02	0 146	1 920	2 054	15 14	0 126	1 545	1 669	13 74
4257 815	0 148	1 897	2 036	14 46	0 144	1 906	2 040	15 04	0 124	1 590	1 714	14 11
4258 477	0 146	1 871	2 010	14 27	0 142	1 866	2 000	14 74	0 128	1 639	1 763	14 51
4265 418	0 152	1 952	2 091	14 85	0 146	1 908	2 042	15 05	0 120	1 540	1 664	13 70
4266 081	0 152	1 945	2 084	14 80	0 140	1 829	1 963	14 47	0 126	1 601	1 725	14 20
4268 915	0 150	1 950	2 069	14 69	0 136	1 790	1 924	14 18	0 116	1 568	1 692	13 93
4270 836	0 152	1 956	2 075	14 73	0 138	1 818	1 952	14 38	0 118	1 583	1 717	14 13
4284 858	0 156	1 964	2 105	14 93	0 140	1 832	1 966	14 49	0 120	1 601	1 725	14 20
4287 566	0 152	1 918	2 057	14 61	0 144	1 883	2 017	14 87	0 120	1 607	1 731	14 25
4288 310	0 154	1 950	2 089	14 83	0 136	1 768	1 902	14 02	0 122	1 540	1 664	13 70
4290 377	0 148	1 872	2 011	14 28	0 150	1 881	2 015	14 85	0 128	1 613	1 737	14 30
4290 542	0 154	1 948	2 087	14 82	0 148	1 850	1 984	14 62	0 130	1 627	1 751	14 41
4291 650	0 152	1 940	2 079	14 76	0 148	1 850	1 984	14 62	0 130	1 623	1 747	14 38
4294 936	0 146	1 855	1 974	14 02	0 142	1 770	1 904	14 03	0 128	1 598	1 722	14 17

λ	$\phi = 45°4$				$\phi = 59°0$				$\phi = 75°3$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
4196 699	0 100	1 214	1 320	13 35	0 064	0 825	0 908	12 52	0 026	0 334	0 383	10 72
4197 257	0 092	1 189	1 295	13 09	0 066	0 871	0 954	13 15	0 026	0 330	0 379	10 60
4203 730												
4209 144	0 096	1 243	1 349	13 64	0 066	0 862	0 945	13 03	0 032	0 392	0 441	12 34
4216 136	0 094	1 212	1 318	13 53	0 068	0 890	0 973	13 41	0 028	0 358	0 407	11 39
4220 509	0 094	1 221	1 327	13 42	0 066	0 874	0 957	13 19	0 030	0 391	0 440	12 31
4232 887	0 092	1 186	1 292	13 06	0 064	0 846	0 929	12 80	0 030	0 393	0 442	12 37
4257 815	0 100	1 279	1 385	14 00	0 072	0 910	0 993	13 69	0 034	0 438	0 487	13 63
4258 177	0 094	1 211	1 317	13 32	0 068	0 873	0 956	13 18	0 032	0 421	0 470	13 15
4265 418	0 098	1 247	1 353	13 68	0 066	0 836	0 919	12 67	0 030	0 383	0 432	12 09
4266 081	0 092	1 175	1 281	12 95	0 064	0 811	0 894	12 32	0 032	0 401	0 450	12 59
4268 915	0 098	1 239	1 345	13 60	0 070	0 900	0 983	13 55	0 032	0 415	0 464	12 98
4270 856	0 096	1 230	1 336	13 51	0 068	0 870	0 953	13 14	0 030	0 389	0 438	12 25
4284 858	0 094	1 197	1 303	13 17	0 070	0 861	0 944	13 01	0 036	0 465	0 514	14 38
4287 566	0 096	1 210	1 316	13 30	0 074	0 890	0 973	13 41	0 034	0 446	0 495	13 85
4288 310	0 098	1 231	1 337	13 52	0 068	0 933	1 016	14 00	0 032	0 432	0 481	13 46
4290 377	0 096	1 219	1 325	13 39	0 070	0 845	0 928	12 79	0 034	0 446	0 495	13 85
4290 542	0 092	1 169	1 275	12 89	0 072	0 874	0 957	13 19	0 026	0 330	0 379	10 60
4291 630	0 096	1 216	1 322	13 36	0 072	0 899	0 982	13 54	0 034	0 432	0 481	13 46
4294 936	0 096	1 219	1 325	13 39	0 072	0 902	0 985	13 58	0 032	0 399	0 448	12 53

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 19 1906, June 12, $6^h 45^m$ G M T Measured by L on T Distance from Limb 2 2 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	80 8	14 9	14 9	75 1	3 1	1 002
O−Ω	60 4	29 9	29 9	60 1	1 6	1 000
P	11 2	44 9	44 9	45 1	1 1	1 000
D	0 9	59 9	59 9	30 1	0 9	1 000
Diameter	169 1 mm	74 9	74 9	15 1	0 8	1 000
Factor	1 027	89 9	89 9	0 1	0 8	1 000

λ	ϕ = 0°1				ϕ = 15°1				ϕ = 30°1			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 150	1 945	2 078	14 75	0 139	1 809	1 941	14 27	0 118	1 533	1 656	13 59
4197 257	0 152	1 970	2 103	14 93	0 140	1 820	1 952	14 35	0 118	1 533	1 656	13 59
4203 730	0 149	1 932	2 065	14 66	0 140	1 817	1 949	14 32	0 122	1 583	1 706	14 00
4209 144	0 148	1 919	2 052	14 57	0 144	1 864	1 996	14 68	0 121	1 567	1 690	13 87
4216 136	0 150	1 937	2 070	14 70	0 137	1 770	1 902	13 99	0 116	1 498	1 621	13 30
4220 509	0 147	1 896	2 029	14 40	0 144	1 817	1 949	14 32	0 119	1 532	1 655	13 58
4232 887	0 156	1 890	2 023	14 36	0 144	1 847	1 979	14 55	0 122	1 565	1 688	13 85
4257 815	0 150	1 904	2 037	14 46	0 140	1 773	1 905	14 01	0 124	1 574	1 697	13 93
4258 477	0 151	1 914	2 047	14 53	0 146	1 848	1 980	14 56	0 123	1 563	1 686	13 84
4265 418	0 152	1 926	2 059	14 62	0 146	1 848	1 980	14 56	0 124	1 571	1 694	13 90
4266 081	0 150	1 901	2 044	14 51	0 143	1 809	1 941	14 27	0 121	1 530	1 653	13 56
4268 915	0 151	1 910	2 043	14 50	0 140	1 769	1 901	13 98	0 124	1 570	1 693	13 89
4276 836	0 152	1 914	2 047	14 53	0 145	1 822	1 954	14 37	0 126	1 588	1 711	14 04
4284 838	0 152	1 910	2 043	14 50	0 145	1 822	1 954	14 37	0 122	1 534	1 657	13 60
4287 566	0 154	1 937	2 070	14 70	0 142	1 782	1 914	14 07	0 124	1 556	1 679	13 78
4288 310	0 153	1 919	0 052	14 57	0 142	1 782	1 914	14 07	0 124	1 556	1 679	13 78
4290 377	0 154	1 932	2 065	14 66	0 141	1 771	1 903	14 00	0 122	1 529	1 652	13 56
4290 542	0 150	1 881	2 014	14 30	0 146	1 830	1 962	14 42	0 125	1 569	1 692	13 88
4291 630	0 152	1 905	2 038	14 47	0 146	1 830	1 962	14 42	0 126	1 574	1 697	13 93
4294 936	0 156	1 954	2 089	14 82	0 144	1 804	1 936	14 23	0 121	1 513	1 636	13 42
	ϕ = 45°1				ϕ = 60°1				ϕ = 75°1			
4196 699	0 088	1 145	1 250	12 57	0 058	0 755	0 835	11 89	0 028	0 364	0 414	11 43
4197 257	0 088	1 145	1 250	12 57	0 059	0 768	0 848	12 08	0 028	0 364	0 414	11 43
4203 730	0 091	1 181	1 286	12 93	0 059	0 766	0 846	12 05	0 031	0 403	0 453	12 51
4209 144	0 092	1 191	1 296	13 03	0 061	0 790	0 870	12 38	0 031	0 402	0 452	12 48
4216 136	0 090	1 162	1 267	12 74	0 058	0 751	0 831	11 84	0 030	0 387	0 437	12 07
4220 509	0 092	1 186	1 291	12 98	0 062	0 799	0 879	12 52	0 032	0 413	0 463	12 78
4232 887	0 090	1 155	1 260	12 67	0 063	0 809	0 889	12 66	0 033	0 423	0 473	13 06
4257 815	0 095	1 209	1 314	13 21	0 064	0 814	0 894	12 73	0 034	0 433	0 483	13 34
4258 477	0 094	1 191	1 296	13 03	0 062	0 788	0 868	12 36	0 033	0 419	0 469	12 95
4265 418	0 092	1 166	1 271	12 78	0 063	0 798	0 878	12 50	0 032	0 406	0 456	12 59
4266 081	0 094	1 190	1 295	13 02	0 065	0 824	0 904	12 87	0 034	0 431	0 481	13 28
4268 915	0 093	1 173	1 278	12 85	0 062	0 783	0 863	12 29	0 033	0 418	0 468	12 92
4276 836	0 091	1 149	1 254	12 61	0 062	0 783	0 863	12 29	0 034	0 430	0 480	13 25
4284 838	0 094	1 183	1 288	12 95	0 065	0 817	0 897	12 78	0 033	0 416	0 466	12 87
4287 566	0 094	1 182	1 287	12 94	0 065	0 805	0 885	12 60	0 033	0 415	0 465	12 84
4288 310	0 093	1 169	1 274	12 81	0 064	0 805	0 885	12 60	0 033	0 415	0 465	12 84
4290 377	0 094	1 181	1 286	12 93	0 062	0 779	0 859	12 23	0 033	0 414	0 464	12 81
4290 542	0 094	1 180	1 285	12 92	0 064	0 804	0 884	12 59	0 034	0 427	0 477	13 17
4291 630	0 094	1 179	1 284	12 91	0 064	0 804	0 884	12 59	0 034	0 426	0 476	13 14
4294 936	0 094	1 179	1 284	12 91	0 066	0 827	0 907	12 92	0 032	0 401	0 451	12 45

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 20 1906, June 12, $7^h\ 15^m$ G M T Measured by L on T Distance from Limb 2 2 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
☉	80 9					
☉−☊	6 5	29 9	29 9	60 1	1 6	1 000
P	11 1	44 9	44 9	45 1	1 1	1 000
D	0 9	59 9	59 9	30 1	0 9	1 000
Diameter	169 1 mm	74 9	74 9	15 1	0 8	1 000
Factor	1 027	89 9	89 9	0 1	0 8	1 000

λ	$\phi = 0°1$				$\phi = 15°1$				$\phi = 30°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 146	1 901	2 034	14 44	0 137	1 779	1 911	14 05	0 116	1 508	1 631	13 38
4197 257	0 147	1 911	2 044	14 51	0 139	1 800	1 932	14 21	0 119	1 544	1 667	13 68
4203 730	0 152	1 971	2 104	14 94	0 141	1 822	1 954	14 37	0 121	1 566	1 689	13 86
4209 144	0 151	1 950	2 083	14 79	0 140	1 806	1 938	14 25	0 122	1 575	1 698	13 93
4216 136	0 148	1 910	2 043	14 50	0 138	1 782	1 914	14 07	0 118	1 523	1 646	13 51
4220 509	0 150	1 935	2 068	14 68	0 142	1 826	1 958	14 40	0 118	1 521	1 644	13 49
4232 887	0 154	1 975	2 108	14 97	0 142	1 820	1 952	14 35	0 122	1 563	1 686	13 84
4257 815	0 156	1 982	2 115	15 02	0 144	1 828	1 960	14 41	0 124	1 575	1 698	13 93
4258 477	0 152	1 929	2 062	14 64	0 143	1 813	1 945	14 30	0 122	1 550	1 673	13 73
4265 418	0 153	1 939	2 072	14 71	0 140	1 772	1 904	14 00	0 121	1 530	1 653	13 56
4266 081	0 153	1 939	2 072	14 71	0 144	1 817	1 949	14 32	0 123	1 551	1 674	13 74
4268 915	0 152	1 924	2 057	14 60	0 143	1 805	1 937	14 24	0 122	1 539	1 662	13 64
4276 836	0 154	1 945	2 078	14 75	0 143	1 803	1 935	14 23	0 122	1 537	1 660	13 62
4284 838	0 150	1 890	2 023	14 36	0 142	1 786	1 918	14 10	0 124	1 559	1 682	13 80
4287 566	0 152	1 910	2 043	14 50	0 142	1 781	1 913	14 07	0 122	1 530	1 653	13 56
4288 310	0 154	1 931	2 064	14 65	0 144	1 805	1 937	14 24	0 121	1 519	1 642	13 47
4290 377	0 152	1 909	2 042	14 49	0 142	1 780	1 912	14 06	0 120	1 508	1 631	13 38
4290 542	0 153	1 920	2 053	14 58	0 143	1 794	1 926	14 16	0 120	1 504	1 627	13 35
4291 630	0 152	1 909	2 042	14 49	0 142	1 780	1 912	14 06	0 122	1 528	1 651	13 55
4294 936	0 156	1 954	2 087	14 82	0 140	1 753	1 885	13 86	0 121	1 517	1 640	13 46
	$\phi = 45°1$				$\phi = 60°1$							
4196 699	0 086	1 116	1 221	12 28	0 056	0 730	0 810	11 54				
4197 257	0 088	1 141	1 246	12 53	0 058	0 752	0 832	11 85				
4203 730	0 090	1 165	1 270	12 77	0 059	0 765	0 845	12 03				
4209 144	0 091	1 178	1 283	12 90	0 060	0 775	0 855	12 18				
4216 136	0 088	1 136	1 241	12 48	0 058	0 749	0 829	11 81				
4220 509	0 089	1 145	1 250	12 57	0 062	0 799	0 879	12 52				
4232 887	0 092	1 179	1 284	12 91	0 062	0 797	0 877	12 49				
4257 815	0 096	1 217	1 322	13 29	0 066	0 839	0 919	13 09				
4258 477	0 094	1 193	1 298	13 05	0 064	0 813	0 893	12 72				
4265 418	0 091	1 151	1 256	12 63	0 063	0 801	0 881	12 55				
4266 081	0 096	1 215	1 320	13 27	0 065	0 823	0 903	12 86				
4268 915	0 093	1 175	1 280	12 87	0 063	0 797	0 877	12 49				
4276 836	0 093	1 173	1 278	12 85	0 062	0 785	0 865	12 32				
4284 838	0 092	1 159	1 262	12 69	0 061	0 770	0 850	12 11				
4287 566	0 090	1 132	1 237	12 42	0 064	0 804	0 884	12 59				
4288 310	0 094	1 181	1 286	12 93	0 062	0 779	0 859	12 23				
4290 377	0 091	1 141	1 246	12 53	0.063	0 790	0 870	12 39				
4290 542	0 091	1 141	1 246	12 53	0 062	0 775	0 855	12 18				
4291 630	0 091	1 141	1 246	12 53	0 064	0 799	0 879	12 52				
4294 936	0 094	1 179	1 284	12 91	0 063	0.789	0 869	12 38				

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 21 1906, June 12, $7^h\ 45^m$ G M T Measured by L on F Distance from Limb 2 2 mm Quality, good

		$p-P$	π	ϕ	η	sec η
		°	°	°	°	
	°	14 9	14 9	75 1	3 2	1 002
O	80 9	29 9	29 9	60 1	1 6	1 000
O−Ω	6 5	44 9	44 9	45 1	1 1	1 000
P	11 1	59 9	59 9	30 1	0 9	1 000
D	0 9	73 9	73 9	16 1	0 8	1 000
Diameter	169 1 mm	74 9	74 9	15 1	0 8	1 000
Factor	1 027	89 9	89 9	0 1	0 8	1 000

λ	$\phi = 0°1$				$\phi = 15°1$				$\phi = 16°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 146	1 897	2 030	14 41	0 138	1 794	1 926	14 16	0 137	1 780	1 912	14 13
4197 257	0 148	1 923	2 056	14 60	0 139	1 801	1 933	14 21	0 138	1 790	1 922	14 20
4203 730	0 149	1 934	2 067	14 67	0 141	1 823	1 955	14 38	0 140	1 812	1 944	14 36
4209 144	0 152	1 963	2 096	14 88	0 142	1 831	1 963	14 21	0 139	1 796	1 928	14 24
4216 136	0 148	1 910	2 043	14 50	0 139	1 793	1 925	14 16	0 138	1 779	1 911	14 12
4220 509	0 150	1 934	2 067	14 67	0 140	1 801	1 933	14 21	0 139	1 791	1 923	14 21
4232 887	0 152	1 942	2 075	14 73	0 143	1 822	1 954	14 37	0 143	1 833	1 965	14 52
4257 815	0 154	1 953	2 086	14 81	0 143	1 825	1 957	14 39	0 145	1 840	1 972	14 57
4258 477	0 152	1 928	2 061	14 63	0 142	1 800	1 932	14 21	0 143	1 815	1 947	14 38
4265 418	0 154	1 949	2 082	14 78	0 144	1 822	1 954	14 37	0 144	1 823	1 955	14 44
4266 081	0 152	1 924	2 057	14 60	0 143	1 808	1 940	14 27	0 142	1 805	1 937	14 31
4268 915	0 150	1 898	2 031	14 42	0 143	1 803	1 935	14 23	0 144	1 822	1 954	14 44
4276 836	0 153	1 930	2 063	14 65	0 145	1 824	1 956	14 38	0 142	1 794	1 926	14 23
4284 838	0 153	1 923	2 056	14 60	0 142	1 786	1 918	14 10	0 144	1 815	1 947	14 38
4287 566	0 154	1 936	2 069	14 69	0 143	1 795	1 927	14 17	0 146	1 835	1 967	14 53
4288 310	0 154	1 935	2 068	14 68	0 143	1 795	1 927	14 17	0 140	1 760	1 892	13 98
4290 377	0 150	1 885	2 018	14 33	0 145	1 819	1 951	14 35	0 143	1 794	1 926	14 23
4290 542	0 152	1 907	2 040	14 48	0 142	1 780	1 912	14 06	0 142	1 784	1 916	14 16
4291 630	0 153	1 920	2 053	14 58	0 144	1 804	1 936	14 24	0 144	1 809	1 941	14 34
4294 936	0 154	1 929	2 062	14 64	0 141	1 768	1 900	13 97	0 145	1 818	1 950	14 41

λ	$\phi = 30°1$				$\phi = 45°1$				$\phi = 60°1$				$\phi = 75°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 116	1 515	1 638	13 44	0 088	1 146	1 251	12 58	0 056	0 727	0 807	11 49	0 027	0 354	0 404	11 15
4197 257	0 120	1 555	1 678	13 77	0 087	1 131	1 236	12 43	0 058	0 749	0 829	11 81	0 029	0 375	0 425	11 73
4203 730	0 120	1 552	1 675	13 74	0 090	1 165	1 270	12 77	0 061	0 788	0 868	12 36	0 030	0 380	0 430	12 12
4209 144	0 120	1 550	1 673	13 73	0 090	1 164	1 269	12 76	0 061	0 787	0 867	12 35	0 030	0 380	0 430	12 12
4216 136	0 118	1 523	1 646	13 51	0 090	1 162	1 267	12 74	0 057	0 735	0 815	11 61	0 029	0 374	0 424	11 71
4220 509	0 120	1 546	1 669	13 70	0 090	1 161	1 266	12 73	0 060	0 774	0 854	12 16	0 031	0 398	0 448	12 37
4232 887	0 121	1 552	1 675	13 75	0 095	1 213	1 318	13 26	0 061	0 779	0 859	12 23	0 032	0 423	0 473	13 04
4257 815	0 124	1 568	1 691	13 88	0 098	1 244	1 349	13 57	0 064	0 810	0 890	12 68	0 034	0 438	0 488	13 47
4258 477	0 122	1 543	1 666	13 67	0 093	1 189	1 294	13 01	0 062	0 785	0 865	12 32	0 034	0 400	0 450	12 67
4265 418	0 122	1 541	1 664	13 65	0 094	1 187	1 292	12 99	0 062	0 784	0 864	12 30	0 032	0 404	0 454	12 54
4266 081	0 123	1 555	1 678	13 78	0 092	1 166	1 271	12 78	0 064	0 808	0 888	12 65	0 031	0 434	0 484	13 36
4268 915	0 121	1 529	1 652	13 56	0 092	1 165	1 270	12 77	0 060	0 759	0 839	11 95	0 034	0 454	0 504	13 92
4276 836	0 122	1 537	1 660	13 62	0 093	1 174	1 279	12 86	0 064	0 806	0 886	12 62	0 032	0 419	0 469	12 95
4284 838	0 121	1 524	1 647	13 52	0 094	1 182	1 287	12 94	0 062	0 784	0 864	12 30	0 032	0 403	0 453	12 51
4287 566	0 122	1 530	1 653	13 56	0 093	1 167	1 272	12 79	0 064	0 801	0 881	12 55	0 034	0 428	0 478	13 20
4288 310	0 122	1 529	1 652	13 56	0 092	1 157	1 262	12 69	0 062	0 779	0 859	12 23	0 034	0 428	0 478	13 20
4290 377	0 126	1 578	1 701	13 96	0 093	1 167	1 272	12 79	0 061	0 769	0 849	12 09	0 032	0 402	0 452	12 48
4290 542	0 123	1 543	1 666	13 67	0 091	1 146	1 251	12 58	0 064	0 800	0 880	12 53	0 031	0 388	0 438	12 09
4291 630	0 124	1 553	1 676	13 75	0 090	1 131	1 236	12 43	0 063	0 789	0 869	12 38	0 034	0 428	0 478	13 20
4294 936	0 122	1 527	1 650	13 54	0 092	1 155	1 260	12 67	0 062	0 779	0 859	12 23	0 034	0 427	0 477	13 17

TABLE 4 —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 23 1906, June 15, 6h 0m G M T Measured by L on T Distance from Limb 2 3 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
☉	83 7	15 0	15 0	75 0	4 5	1 003
☉−Ω	9 3	31 0	31 0	59 0	2 3	1 001
P	9 9	45 0	45 0	45 0	1 7	1 000
D	1 2	60 0	60 0	30 0	1 4	1 000
Diameter	169 3 mm	75 0	75 0	15 0	1 2	1 000
Factor	1 028	90 0	90 0	0 0	1 2	1 000

λ	ϕ = 0°0				ϕ = 15°0				ϕ = 30°0			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 146	1 900	2 033	14 43	0 138	1 797	1 929	14 18	0 118	1 536	1 659	13 60
4197 257	0 148	1 925	2 058	14 61	0 138	1 797	1 929	14 18	0 119	1 547	1 670	13 69
4203 730	0 149	1 936	2 069	14 69	0 140	1 815	1 947	14 31	0 119	1 545	1 668	13 67
4209 144	0 150	1 913	2 046	14 53	0 141	1 824	1 956	14 38	0 121	1 567	1.690	13 85
4216 136	0 148	1 893	2 026	14 38	0 138	1 785	1 917	14 09	0 118	1 526	1 649	13 52
4220 509	0 150	1 903	2 036	14 45	0 140	1 808	1 940	14 26	0 118	1 524	1 647	13 50
4232 887	0 150	1 903	2 036	14 45	0 142	1 825	1 957	14 38	0 122	1 566	1 689	13 85
4257 815	0 152	1 930	2 063	14 65	0 143	1 817	1 949	14 33	0 122	1 547	1 670	13 69
4258 477	0 153	1 948	2 081	14 77	0 143	1 817	1 949	14 33	0 123	1.557	1 680	13 77
4265 418	0 154	1 952	2 085	14 80	0 145	1 832	1 964	14 44	0 122	1 544	1 667	13 67
4266 081	0 152	1 926	2 059	14 62	0 142	1 800	1 932	14 20	0 123	1 554	1 677	13 75
4268 915	0 153	1 935	2 068	14 68	0 144	1 820	1 952	14 35	0 124	1 571	1 694	13 88
4276 836	0 156	1 969	2 102	14 92	0 140	1 768	1 900	13 96	0 121	1.526	1 649	13 52
4284 838	0 153	1 928	2 061	14 63	0 142	1 786	1 918	14 10	0 123	1 548	1 671	13 70
4287 566	0 153	1 927	2 060	14 62	0 143	1 798	1 930	14 18	0 121	1 522	1 645	13 49
4288 310	0 152	1 909	2 042	14 50	0 143	1 798	1 930	14 18	0 123	1 546	1 669	13 68
4290 377	0 152	1 909	2 042	14 50	0 142	1 783	1 915	14 08	0 124	1 560	1 683	13 80
4290 542	0 151	1 898	2 031	14 42	0 142	1 783	1 915	14 08	0 122	1 535	1 658	13 59
4291 630	0 152	1 907	2 040	14 48	0 144	1 807	1 939	14 25	0 123	1 545	1 668	13 67
4294 936	0 152	1 907	2 040	14 48	0 142	1 781	1 912	14 05	0 124	1.558	1 681	13.78
	ϕ = 45°0				ϕ = 59°0				ϕ = 75°0			
4196 699	0 087	1 132	1 237	12 42	0 057	0 743	0 825	11 37	0 029	0 380	0 430	11 80
4197 257	0 090	1 163	1 268	12 73	0 057	0 743	0 825	11 37	0 030	0 391	0 441	12 10
4203 730	0 088	1 145	1 250	12 55	0 059	0 766	0 848	11 69	0 028	0 365	0 415	11 38
4209 144	0 092	1 191	1 296	13 01	0 060	0 776	0 858	11 83	0 030	0 389	0 439	12 04
4216 136	0 087	1 122	1 227	12 32	0 058	0 750	0 832	11 47	0 029	0 378	0 428	11 74
4220 509	0 088	1 137	1 242	12 47	0 061	0 787	0 869	11 98	0 030	0 388	0 438	12 01
4232 887	0 090	1 154	1 259	12 64	0 062	0 799	0 881	12 14	0 031	0 398	0 448	12 29
4257 815	0 092	1 170	1 275	12 80	0 062	0 791	0 873	12 03	0 031	0 396	0 446	12 23
4258 477	0 094	1 195	1 300	13 05	0 062	0 791	0 873	12 03	0 030	0 379	0 429	11 77
4265 418	0 092	1 165	1 270	12 75	0 063	0 800	0 882	12 16	0 032	0 386	0 436	11 96
4266 081	0 090	1 139	1 244	12 49	0 062	0 789	0 871	12 01	0 034	0 431	0 481	13 19
4268 915	0 091	1 151	1 256	12 61	0 058	0 734	0 816	11 25	0 032	0 405	0 455	12 48
4276 836	0 092	1 161	1 266	12 71	0 062	0 787	0.869	11 98	0 032	0 405	0 455	12 48
4284 838	0 094	1 184	1 289	12 94	0 063	0 793	0 875	12 06	0 031	0 393	0 443	12 15
4287 566	0 092	1 158	1 263	12 68	0 061	0 766	0 848	11 69	0 031	0 393	0 443	12 15
4288 310	0 093	1 164	1 269	12 74	0 062	0 780	0 862	11 88	0 031	0 393	0 443	12 15
4290 377	0 089	1 116	1 221	12 26	0 062	0 779	0 861	11 87	0 032	0 403	0 453	12 43
4290 542	0 090	1 131	1 236	12 41	0 060	0 755	0 837	11 54	0 032	0 403	0 453	12 43
4291 630	0 094	1 182	1 287	12 91	0 061	0 765	0 847	11 68	0 032	0 403	0 453	12 43
4294 936	0 090	1 130	1 235	12 40	0 065	0 815	0 897	12 36	0 031	0 389	0 439	12.04

TABLE 4 —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 24 1906, June 15, 6^h 15^m G M T Measured by L on T Distance from Limb 2 4 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	83 7	15 0	15 0	75 0	4 5	1 003
O−Ω	9 3	30 0	30 0	60 0	2 2	1 001
P	9 9	45 0	45 0	45 0	1 7	1 000
D	1 2	60 0	60 0	30 0	1 4	1 000
Diameter	169 5 mm	75 0	75 0	15 0	1 2	1 000
Factor	1 030	90 0	90 0	0 0	1 2	1 000

λ	$\phi = 0°0$				$\phi = 15°0$				$\phi = 30°0$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 148	1 923	2 056	14 60	0 138	1 795	1 927	14 16	0 118	1 540	1 663	13 63
4197 257	0 147	1 912	2 045	14 52	0 138	1 795	1 927	14 16	0 117	1 525	1 648	13 51
4203 730	0 150	1 946	2 079	14 76	0 138	1 792	1 924	14 14	0 121	1 575	1 698	13 92
4209 144	0 150	1 944	2 077	14 75	0 140	1 815	1 947	14 31	0 120	1 558	1 681	13 78
4216 136	0 146	1 890	2 023	14 36	0 138	1 790	1 922	14 13	0 118	1 528	1 651	13 53
4220 509	0 150	1 940	2 073	14 72	0 141	1 821	1 953	14 35	0 122	1 581	1 704	13 97
4232 887	0 152	1 955	2 088	14 82	0 142	1 827	1 959	14 40	0 122	1 571	1 694	13 89
4257 815	0 153	1 951	2 084	14 79	0 145	1 848	1 980	14 55	0 122	1 553	1 676	13 74
4258 477	0 154	1 958	2 091	14 85	0 142	1 805	1 937	14 24	0 121	1 541	1 664	13 64
4265 418	0 155	1 969	2 102	14 92	0 142	1 802	1 934	14 21	0 123	1 562	1 685	13 81
4266 081	0 153	1 939	2 072	14 71	0 143	1 816	1 948	14 32	0 121	1 537	1 660	13 61
4268 915	0 153	1 937	2 070	14 70	0 142	1 801	1 933	14 21	0 122	1 548	1 671	13 70
4276 836	0 152	1 923	2 056	14 60	0 144	1 822	1 954	14 36	0 123	1 555	1 678	13 76
4284 838	0 153	1 931	2 064	14 65	0 142	1 788	1 920	14 11	0 123	1 551	1 674	13 72
4287 566	0 153	1 926	2 059	14 62	0 144	1 814	1 946	14 30	0 122	1 536	1 659	13 60
4288 310	0 155	1 951	2 084	14 80	0 143	1 800	1 932	14 20	0 124	1 560	1 683	13 80
4290 377	0 151	1 900	2 033	14 43	0 142	1 785	1 917	14 09	0 123	1 547	1 670	13 69
4290 542	0 152	1 911	2 044	14 51	0 143	1 799	1 931	14 19	0 122	1 535	1 658	13 59
4291 630	0 153	1 924	2 057	14 60	0 142	1 785	1 917	14 09	0 125	1 571	1 694	13 89
4294 936	0 152	1 909	2 042	14 50	0 144	1 808	1 940	14 26	0 124	1 555	1 678	13 76

λ	$\phi = 45°0$				$\phi = 60°0$				$\phi = 75°0$			
4196 699	0 089	1 162	1 267	12 72	0 060	0 779	0 861	12 23	0 028	0 366	0 416	11 41
4197 257	0 088	1 147	1 252	12 57	0 058	0 754	0 836	11 87	0 028	0 366	0 416	11 41
4203 730	0 090	1 172	1 277	12 82	0 060	0 778	0 860	12 21	0 030	0 390	0 440	12 07
4209 144	0 091	1 182	1 287	12 92	0 059	0 763	0 845	12 00	0 031	0 400	0 450	12 34
4216 136	0 088	1 140	1 245	12 50	0 058	0 751	0 833	11 83	0 030	0 389	0 439	12 04
4220 509	0 090	1 164	1 269	12 74	0 060	0 777	0 859	12 20	0 030	0 389	0 439	12 04
4232 887	0 091	1 172	1 277	12 82	0 062	0 800	0 882	12 52	0 032	0 412	0 462	12 67
4257 815	0 092	1 171	1 276	12 81	0 066	0 841	0 923	13 11	0 034	0 431	0 481	13 19
4258 477	0 091	1 159	1 264	12 69	0 062	0 789	0 871	12 37	0 033	0 420	0 470	12 89
4265 418	0 093	1 181	1 286	12 91	0 064	0 815	0 897	12 74	0 033	0 420	0 470	12 89
4266 081	0 094	1 194	1 299	13 04	0 062	0 787	0 869	12 34	0 033	0 420	0 470	12 89
4268 915	0 092	1 167	1 272	12 77	0 062	0 787	0 869	12 34	0 032	0 405	0 455	12 48
4276 836	0 092	1 164	1 269	12 74	0 063	0 800	0 882	12 52	0 031	0 394	0 444	12 18
4284 838	0 090	1 135	1 240	12 45	0 062	0 782	0 864	12 37	0 031	0 393	0 443	12 15
4287 566	0 093	1 170	1 275	12 80	0 065	0 816	0 898	12 75	0 035	0 441	0 491	13 47
4288 310	0 092	1 158	1 263	12 68	0 063	0 792	0 874	12 41	0 032	0 404	0 454	12 45
4290 377	0 094	1 182	1 287	12 92	0 060	0 762	0 844	11 98	0 032	0 404	0 454	12 45
4290 542	0 093	1 170	1 275	12 80	0 062	0 781	0 863	12 25	0 033	0 414	0 464	12 73
4291 630	0 093	1 169	1 274	12 79	0 066	0 831	0 913	12 96	0 032	0 403	0 453	12 43
4294 936	0 094	1 179	1 284	12 89	0 064	0 806	0 888	12 61	0 032	0 403	0 453	12 43

TABLE 4.—RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907—Continued

Plate ω 25 1906, June 15, 6^h 35^m G M T Measured by L on T Distance from Limb 2 3 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
☉	83 7	15 0	15 0	75 0	4 5	1 003
☉−☊	9 3	30 0	30 0	60 0	2 3	1 001
P	9 9	45 0	45 0	45 0	1 7	1 000
D	1 2	60 0	60 0	30 0	1 4	1 000
Diameter	169 5 mm	75 0	75 0	15 0	1 2	1 000
Factor	1 030	90 0	90 0	0 0	1 2	1 000

λ	$\phi = 0°0$ Δ	v	$v+v_1$	ξ	$\phi = 15°0$ Δ	v	$v+v_1$	ξ	$\phi = 30°0$ Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 149	1 943	2 076	14 74	0 139	1 810	1 942	14 27	0 118	1 537	1 660	13 61
4197 257	0 150	1 957	2 090	14 84	0 142	1 847	1 979	14 55	0 120	1 564	1 687	13 83
4203 730	0 151	1 965	2 098	14 89	0 144	1 869	2 001	14 71	0 118	1 540	1 663	13 63
4209 144	0 154	1 989	2 122	15 06	0 144	1 867	1 999	14 69	0 127	1 651	1 774	14 54
4216 136	0 146	1 889	2 022	14 36	0 141	1 823	1 955	14 37	0 116	1 502	1 625	13 32
4220 509	0 150	1 937	2 070	14 70	0 146	1 887	2 019	14 84	0 125	1 614	1 737	14 24
4232 887	0 151	1 943	2 076	14 74	0 144	1 853	1 985	14 59	0 120	1 542	1 665	13 65
4257 815	0 150	1 911	2 044	14 51	0 145	1 843	1 975	14 52	0 124	1 576	1 699	13 93
4258 477	0 155	1 961	2 094	14 87	0 145	1 843	1 975	14 52	0 120	1 526	1 649	13 52
4265 418	0 147	1 867	2 000	14 20	0 146	1 854	1 986	14 60	0 125	1 586	1 709	14 01
4266 081	0 151	1 917	2 050	14 55	0 148	1 878	2 010	14 77	0 120	1 524	1 647	13 50
4268 915	0 152	1 927	2 060	14 62	0 146	1 851	1 983	14 58	0 121	1 530	1 653	13 55
4276 836	0 151	1 909	2 042	14 50	0 143	1 808	1 940	14 26	0 122	1 541	1 664	13 64
4284 838	0 154	1 941	2 074	14 72	0 144	1 818	1 950	14 33	0 122	1 538	1 661	13 62
4287 566	0 154	1 936	2 069	14 69	0 146	1 839	1 971	14 49	0 119	1 499	1 622	13 30
4288 310	0 153	1 925	2 058	14 61	0 142	1 777	1 909	14 03	0 117	1 474	1 597	13 09
4290 377	0 152	1 911	2 044	14 51	0 138	1 738	1 870	13 74	0 120	1 508	1 631	13 37
4290 542	0 153	1 921	2 054	14 58	0 142	1 776	1 908	14 02	0 122	1 533	1 656	13 58
4291 630	0 150	1 888	2 021	14 35	0 142	1 776	1 908	14 02	0 119	1 497	1 620	13 28
4294 936	0 152	1 909	2 042	14 50	0 144	1 808	1 940	14 26	0 121	1 517	1 640	13 44

λ	$\phi = 45°0$ Δ	v	$v+v_1$	ξ	$\phi = 60°0$ Δ	v	$v+v_1$	ξ	$\phi = 75°0$ Δ	v	$v+v_1$	ξ
4196 699	0 087	1 135	1 240	12 45	0 054	0 703	0 785	11 15	0 026	0 340	0 390	10 63
4197 257	0 088	1 147	1 252	12 57	0 059	0 769	0 851	12 08	0 035	0 442	0 492	13 41
4203 730	0 086	1 120	1 225	12 30	0 063	0 819	0 901	12 79	0 032	0 416	0 466	12 70
4209 144	0 090	1 169	1 274	12 79	0 066	0 855	0 937	13 30	0 031	0 405	0 455	12 40
4216 136	0 086	1 114	1 219	12 24	0 053	0 685	0 767	10 89	0 025	0 324	0 374	10 19
4220 509	0 096	1 242	1 347	13 52	0 058	0 748	0 830	11 79	0 031	0 342	0 392	10 68
4232 887	0 093	1 197	1 302	13 07	0 062	0 798	0 880	12 50	0 032	0 411	0 461	12 56
4257 815	0 092	1 171	1 276	12 81	0 062	0 790	0 872	12 38	0 034	0 447	0 497	13 54
4258 477	0 090	1 145	1 250	12 55	0 060	0 764	0 846	12 01	0 027	0 345	0 395	10 76
4265 418	0 086	1 092	1 197	12 02	0 064	0 759	0 841	11 94	0 031	0 394	0 444	12.10
4266 081	0 096	1 220	1 325	13 30	0 061	0 776	0 858	12 18	0 026	0 331	0 381	10 38
4268 915	0 091	1 155	1 260	12 65	0 065	0 776	0 858	12 18	0 032	0 406	0 456	12 43
4276 836	0 090	1 138	1 243	12 48	0 063	0 800	0 882	12 52	0 032	0 406	0 456	12 43
4284 838	0 095	1 095	1 200	12 05	0 068	0 857	0 939	13 33	0 028	0 354	0 404	11 01
4287 566	0 092	1 158	1 263	12 68	0 066	0 832	0 914	12 98	0 030	0 378	0 428	11 66
4288 310	0 091	1 145	1 250	12 55	0 057	0 717	0 799	11 35	0 029	0.364	0 414	11 28
4290 377	0 096	1 207	1 312	13 17	0 064	0 807	0 889	12 62	0 037	0 465	0 515	14 04
4290 542	0 092	1 157	1 262	12 67	0 062	0 782	0 864	12 27	0 028	0 373	0 423	11 53
4291 630	0 097	1 219	1 324	13 29	0 059	0 742	0 824	11 70	0 029	0 364	0 414	11 28
4294 936	0 097	1 217	1 322	13 27	0 064	0 802	0 884	12 55	0 028	0 353	0 403	10 98

TABLE 4 —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 26 1906, June 16, $6^h\ 20^m$ G M T Measured by L on T Distance from Limb 2 7 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	84 5	15 0	15 1	74 9	4 9	1 004
O−Ω	10 1	30 0	30 0	60 0	2 5	1 001
P	9 5	45 0	45 0	45 0	1 8	1 001
D	1 3	60 0	60 0	30 0	1 5	1 000
Diameter	170 0 mm	75 0	75 0	15 0	1 3	1 000
Factor	1 033	90 0	90 0	0 0	1 3	1 000

λ	$\phi = 0°0$				$\phi = 15°0$				$\phi = 30°0$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 150	1 956	2 089	14 83	0 138	1 804	1 936	14 22	0 114	1 491	1 614	13 22
4197 257	0 148	1 936	2 069	14 69	0 138	1 803	1 935	14 22	0 115	1 501	1 624	13 30
4203 730	0 148	1 931	2 064	14 65	0 144	1 878	2 010	14 77	0 116	1 509	1 632	13 37
4209 144	0 152	1 972	2 105	14 94	0 144	1 876	2 008	14 75	0 120	1 558	1 681	13 77
4216 136	0 147	1 910	2 043	14 50	0 137	1 777	1 909	14 02	0 112	1 455	1 578	12 92
4220 509	0 147	1 910	2 043	14 50	0 144	1 867	1 999	14 69	0 122	1 581	1 704	13 96
4232 887	0 152	1 963	2 096	14 88	0 144	1 858	1 990	14 62	0 121	1 562	1 685	13 80
4257 815	0 159	2 030	2 163	15 36	0 144	1 848	1 980	14 55	0 118	1 506	1 629	13 34
4258 477	0 155	1 978	2 111	14 99	0 147	1 876	2 008	14 75	0 120	1 527	1 650	13 51
4265 418	0 152	1 936	2 069	14 69	0 145	1 848	1 980	14 55	0 123	1 565	1 688	13 82
4266 081	0 152	1 935	2 068	14 68	0 146	1 858	1 990	14 62	0 118	1 503	1 626	13 32
4268 915	0 152	1 934	2 067	14 67	0 150	1 907	2 039	14 98	0 116	1 476	1 599	13 10
4276 836	0 151	1 912	2 045	14 52	0 144	1 823	1 955	14 36	0 120	1 520	1 643	13 46
4284 838	0 154	1 945	2 078	14 75	0 148	1 867	1 999	14 69	0 116	1 475	1 598	13 09
4287 566	0 151	1 907	2 040	14 48	0 148	1 867	1 999	14 69	0 122	1 538	1 661	13 60
4288 310	0 150	1 904	2 037	14 46	0 149	1 880	2 012	14 78	0 117	1 481	1 604	13 14
4290 377	0 155	1 964	2 097	14 89	0 142	1 790	1 922	14 12	0 118	1 491	1 614	13 22
4290 542	0 154	1 942	2 075	14 73	0 144	1 815	1 947	14 30	0 120	1 512	1 635	13 39
4291 630	0 148	1 868	2 001	14 21	0 146	1 841	1 973	14 49	0 121	1 522	1 645	13 47
4294 936	0 157	1 976	2 109	14 97	0 144	1 811	1 943	14 27	0 120	1 510	1 633	13 37

λ	$\phi = 45°0$				$\phi = 60°0$				$\phi - 71°9$			
4196 699	0 087	1 136	1 241	12 45	0 060	0 787	0 867	12 27	0 033	0 434	0 484	13 19
4197 257	0 086	1 126	1 231	12 35	0 058	0 761	0 841	11 91	0 030	0 393	0 443	12 07
4203 730	0 088	1 145	1 250	12 54	0 061	0 796	0 876	12 40	0 031	0 407	0 457	12 45
4209 144	0 093	1 206	1 311	13 14	0 060	0 782	0 862	12 20	0 036	0 469	0 519	14 14
4216 136	0 088	1 142	1 247	12 51	0 065	0 846	0 926	13 11	0 030	0 391	0 441	12 02
4220 509	0 093	1 203	1 308	13 12	0 061	0 793	0 873	12 36	0 030	0 390	0 440	11 99
4232 887	0 090	1 160	1 265	12 69	0 062	0 801	0 881	12 47	0 034	0 438	0 488	13 30
4257 815	0 090	1 150	1 255	12 59	0 054	0 732	0 812	11 49	0 030	0 383	0 433	11 80
4258 477	0 092	1 174	1 279	12 83	0 065	0 830	0 913	12 92	0 035	0 445	0 495	13 49
4265 418	0 090	1 148	1 253	12 57	0 059	0 753	0 833	11 79	0 030	0 382	0 432	11 77
4266 081	0 095	1 209	1 314	13 18	0 063	0 803	0 883	12 50	0 032	0 409	0 459	12 51
4268 915	0 094	1 197	1 302	13 06	0 060	0 763	0 843	11 93	0 035	0 444	0 494	13 46
4276 836	0 092	1 166	1 271	12 75	0 063	0 801	0 881	12 47	0 028	0 382	0 432	11 77
4284 838	0 092	1 163	1 268	12 72	0 057	0 716	0 796	11 27	0 034	0 431	0 481	13 11
4287 566	0 093	1 173	1 278	12 82	0 068	0 860	0 940	13 31	0 034	0 431	0 481	13 11
4288 310	0 095	1 199	1 304	13 08	0 061	0 770	0 850	12 03	0 030	0 380	0 430	11 72
4290 377	0 092	1 159	1 264	12 68	0 061	0 769	0 849	12 02	0 032	0 406	0 456	12 43
4290 542	0 094	1 183	1 288	12 92	0 057	0 719	0 799	11 31	0 031	0 391	0 441	12 02
4291 630	0 094	1 183	1 288	12 92	0 058	0 733	0 813	11 51	0 028	0 355	0 405	11 04
4294 936	0 096	1 207	1 312	13 16	0 064	0 804	0 884	12 51	0 030	0 379	0 429	11 69

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 27 1906, June 16, $7^h 5^m$ G M T Measured by L on T Distance from Limb 2 7 mm Quality, good

		$p-P$	π	ϕ	η	sec η
		°	°	°	°	
O	84 6	15 0	15 1	74 9	4 9	1 004
O−Ω	10 2	30 0	30 0	60 0	2 5	1 001
P	9 5	45 0	45 0	45 0	1 8	1 001
D	1 3	60 0	60 0	30 0	1 5	1 000
Diameter	170 0 mm	75 0	75 0	15 0	1 3	1 000
Factor	1 033	90 0	90 0	0 0	1 3	1 000

λ	ϕ = 0°0				ϕ = 15°0				ϕ = 30°0			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 152	1 990	2 123	15 07	0 136	1 779	1 911	14 04	0 114	1 491	1 614	13 23
4197 257	0 146	1 909	2 042	14 50	0 134	1 753	1 885	13 85	0 116	1 516	1 639	13 44
4203 730	0 146	1 906	2 039	14 48	0 137	1 785	1 917	14 09	0 119	1 552	1 675	13 73
4209 144	0 148	1 928	2 061	14 63	0 142	1 851	1 983	14 58	0 122	1 584	1 707	13 99
4216 136	0 150	1 949	2 082	14 78	0 138	1 791	1 923	14 13	0 116	1 510	1 623	13 31
4220 509	0 152	1 972	2 105	14 94	0 145	1 879	2 011	14 78	0 126	1 633	1 756	14 40
4232 887	0 150	1 937	2 070	14 70	0 142	1 834	1 966	14 45	0 121	1 555	1 678	13 76
4257 815	0 153	1 953	2 086	14 81	0 146	1 866	1 998	14 69	0 126	1 604	1 727	14 16
4258 477	0 152	1 941	2 074	14 72	0 145	1 851	1 983	14 58	0 119	1 517	1 640	13 44
4265 418	0 148	1 885	2 018	14 33	0 141	1 793	1 925	14 15	0 122	1 553	1 676	13 74
4266 081	0 148	1 885	2 018	14 33	0 141	1 792	1 924	14 14	0 122	1 553	1 676	13 74
4268 915	0 153	1 947	2 080	14 77	0 149	1 893	2 025	14 88	0 123	1.563	1 686	13 82
4276 836	0 146	1 852	1 985	14 09	0 142	1 799	1 932	14 20	0 119	1 510	1 633	13 39
4284 838	0 148	1 872	2 005	14 23	0 145	1 833	1 965	14 44	0 118	1 490	1 613	13 22
4287 566	0 151	1 906	2 039	14 48	0 147	1 856	1 988	14 61	0 117	1 478	1 601	13 12
4288 310	0 151	1 906	2 039	14 48	0 142	1 790	1 922	14 13	0 124	1 564	1 687	13 83
4290 377	0 151	1 905	2 038	14 47	0 141	1 780	1 912	14 05	0 118	1 488	1 611	13 21
4290 542	0 159	2 005	2 138	15 18	0 148	1 865	1 997	14 68	0 120	1 509	1 632	13 38
4291 630	0 161	2 029	2 162	15 35	0 142	1 790	1 922	14 13	0 121	1 522	1 645	13 49
4294 936	0 156	1 963	2 096	14 88	0 147	1 850	1 982	14 57	0 120	1 507	1 630	13 36
	ϕ = 45°0				ϕ = 60°0				ϕ = 74°9			
4196 699	0 084	1 092	1 197	12 02	0 056	0 739	0 819	11 63	0 032	0 432	0 482	13 14
4197 257	0 088	1 153	1 258	12 63	0 059	0 772	0 852	12 10	0 029	0 394	0 444	12 10
4203 730	0 082	1 069	1 174	11 79	0 060	0 782	0 862	12 24	0 034	0 457	0 507	13 82
4209 144	0 095	1 238	1 338	13 43	0 060	0 778	0 858	12 18	0 030	0 404	0 454	12 37
4216 136	0 086	1 118	1 223	12 28	0 061	0 794	0 874	12 41	0 032	0 430	0 480	13 08
4220 509	0 092	1 190	1 295	13 00	0 058	0 752	0 834	11 84	0 029	0 392	0 442	12 05
4232 887	0 094	1 216	1 321	13 26	0 056	0 706	0 786	11 16	0 028	0 375	0 425	11 58
4257 815	0 092	1.176	1 281	12 86	0 059	0 749	0 829	11 77	0 026	0 343	0 393	10 71
4258 477	0 092	1 174	1 279	12 84	0 060	0 768	0 848	12 04	0 034	0 449	0 499	13 60
4265 418	0 093	1 185	1 290	12 95	0 061	0 778	0 858	12 18	0 034	0 448	0 498	13 57
4266 081	0 096	1 220	1 325	13 30	0 058	0 737	0 817	11 60	0 035	0 462	0 512	13 95
4268 915	0 092	1 169	1 274	12 79	0 060	0 758	0 838	11 90	0 028	0 369	0 419	11 42
4276 836	0 096	1 218	1 323	13 28	0 058	0 736	0 816	11 59	0 028	0 369	0 419	11 42
4284 838	0 096	1 216	1 321	13 26	0 058	0 734	0 814	11 56	0 032	0 427	0 477	13 00
4287 566	0 088	1 114	1 219	12 24	0 056	0 705	0 783	11 15	0 031	0 408	0 458	12 48
4288 310	0 084	1 062	1 167	11 72	0 060	0 751	0 831	11 80	0 030	0 393	0 443	12 07
4290 377	0 093	1 174	1 279	12 84	0 046	0 685	0.765	10 86	0 031	0 408	0 458	12 48
4290 542	0 096	1 211	1 316	13 21	0 048	0 730	0 810	11 50	0 037	0 483	0 533	14 53
4291 630	0 091	1 148	1 253	12 58	0 059	0 743	0 823	11 69	0 033	0 433	0 483	13 16
4294 936	0 093	1 173	1 278	12 83	0 058	0 733	0 813	11 54	0 036	0 470	0 520	14 17

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 30 1906, Oct 19, $11^h 10^m$ G M T Measured by A on G Distance from Limb 3 6 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	205 6	14 9	15 8	74 2	20 4	1 067
O−Ω	131 2	29 9	30 3	59 7	10 8	1 018
P	−26 2	44 9	45 2	44 8	7 7	1 009
D	5 4	59 9	60 0	30 0	6 3	1 006
Diameter	171 9 mm	74 9	75 0	15 0	5 6	1 005
Factor	1 044	89 9	89 9	0 1	5 4	1 005

λ	$\phi = 0°1$				$\phi = 15°0$				$\phi = 30°0$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 148	1 967	2 106	14 95	0 136	1 808	1 947	14 31	0 114	1 516	1 642	13 46
4197 257	0 148	1 966	2 105	14 94	0 136	1 807	1 946	14 30	0 112	1 489	1 615	13 24
4203 730	0 148	1 962	2 101	14 92	0 138	1 830	1 969	14 47	0 116	1 540	1 666	13 66
4209 144	0 148	1 958	2 097	14 89	0 136	1 799	1 938	14 24	0 116	1 537	1 663	13 63
4216 136	0 146	1 926	2 065	14 66	0 135	1 781	1 920	14 11	0 113	1 492	1 618	13 26
4220 509	0 148	1 949	2 088	14 82	0 138	1 817	1 956	14 38	0 118	1 555	1 681	13 78
4232 887	0 150	1 966	2 105	14 94	0 137	1 796	1 935	14 22	0 118	1 548	1 674	13 72
4257 815	0 150	1 946	2 085	14 80	0 139	1 803	1 942	14 27	0 120	1 558	1 684	13 80
4258 477	0 149	1 933	2 072	14 71	0 138	1 790	1 929	14 18	0 119	1 545	1 661	13 62
4265 418	0 150	1 941	2 080	14 77	0 138	1 786	1 925	14 15	0 118	1 528	1 654	13 56
4266 081	0 150	1 941	2 080	14 77	0 138	1 786	1 925	14 15	0 118	1 528	1 654	13 56
4268 915	0 152	1 964	2 103	14 93	0 140	1 809	1 948	14 32	0 118	1 526	1 652	13 54
4276 836	0 148	1 905	2 044	14 51	0 138	1 777	1 916	14 08	0 116	1 496	1 622	13 30
4284 838	0 150	1 925	2 064	14 65	0 139	1 785	1 924	14 14	0 118	1 516	1 642	13 46
4287 566	0 152	1 949	2 088	14 82	0 139	1 782	1 921	14 12	0 117	1 502	1 628	13 35
4288 310	0 150	1 923	2 062	14 64	0 138	1 769	1 908	14 02	0 118	1 514	1 640	13 44
4290 377	0 148	1 896	2 035	14 45	0 140	1 793	1 932	14 20	0 116	1 487	1 613	13 22
4290 542	0 148	1 896	2 035	14 45	0 139	1 780	1 919	14 10	0 118	1 513	1 639	13 44
4291 630	0 149	1 907	2 046	14 52	0 140	1 793	1 932	14 20	0 118	1 512	1 638	13 43
4294 936	0 148	1 892	2 031	14 42	0 144	1 841	1 980	14 55	0 118	1 510	1 636	13 41
	$\phi = 44°8$				$\phi = 59°7$				$\phi = 74°2$			
4196 699	0 090	1 201	1 308	13 08	0 057	0 767	0 847	11 92	0 022	0 311	0 358	9 33
4197 257	0 090	1 201	1 308	13 08	0 054	0 713	0 793	11 16	0 026	0 372	0 419	10 93
4203 730	0 093	1 238	1 345	13 45	0 056	0 752	0 832	11 71	0 028	0 400	0 447	11 66
4209 144	0 092	1 222	1 329	13 29	0 058	0 777	0 857	12 06	0 023	0 321	0 368	9 60
4216 136	0 089	1 179	1 286	12 86	0 056	0 750	0 830	11 68	0 024	0 342	0 389	10 14
4220 509	0 092	1 217	1 324	13 24	0 058	0 774	0 854	12 02	0 026	0 357	0 404	11 32
4232 887	0 091	1 198	1 305	13 05	0 058	0 770	0 850	11 97	0 026	0 364	0 411	10 72
4257 815	0 090	1 173	1 280	12 80	0 060	0 789	0 869	12 23	0 028	0 391	0 438	11 42
4258 477	0 092	1 199	1 306	13 06	0 059	0 776	0 856	12 05	0 028	0 385	0 432	11 26
4265 418	0 094	1 221	1 328	13 28	0 060	0 787	0 867	12 20	0 028	0 387	0 434	11 32
4266 081	0 096	1 247	1 354	13 54	0 060	0 787	0 867	12 20	0 028	0 389	0 436	11 37
4268 915	0 096	1 245	1 352	13 52	0 059	0 773	0 853	12 01	0 026	0 354	0 401	10 46
4276 836	0 093	1 203	1 310	13 10	0 058	0 756	0 836	11 77	0 027	0 374	0 421	10 98
4284 838	0 096	1 238	1 345	13 45	0 058	0 754	0 834	11 74	0 026	0 348	0 395	10 30
4287 566	0 095	1 223	1 330	13 30	0 058	0 753	0 833	11 73	0 030	0 403	0 450	11 73
4288 310	0 094	1 211	1 318	13 18	0 059	0 766	0 846	11 91	0 026	0 348	0 395	10 30
4290 377	0 096	1 235	1 342	13 42	0 058	0 752	0 832	11 71	0 027	0 362	0 409	10 66
4290 542	0 097	1 247	1 354	13 54	0 058	0 752	0 832	11 71	0 030	0 413	0 460	11 99
4291 630	0 096	1 235	1 342	13 42	0 058	0 752	0 832	11 71	0 028	0 386	0 433	11 29
4294 936	0 097	1 245	1 352	13 52	0 060	0 777	0 857	12 06	0 027	0 364	0 411	10 72

TABLE 4 —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 31 1906, Oct 19, 12^{h} 10^{m} G M T Measured by A on G Distance from Limb 3 6 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	205 7	14 9	15 8	74 2	20 4	1 067
O−Ω	131 3	29 9	30 3	59 7	10 8	1 018
P	−26 2	44 9	45 2	44 8	7 7	1 009
D	5 4	59 9	60 0	30 0	6 3	1 006
Diameter	171 9 mm	74 9	75 0	15 0	5 6	1 005
Factor	1 044	89 9	89 9	0 1	5 4	1 005

λ	$\phi = 0°1$				$\phi = 15°0$				$\phi = 30°0$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 148	1 967	2 106	14 95	0 138	1 834	1 972	14 49	0 116	1 544	1 670	13 69
4197 257	0 147	1 954	2 093	14 86	0 138	1 834	1 972	14 49	0 118	1 569	1 695	13 90
4203 730	0 149	1 976	2 115	15 02	0 140	1 856	1 994	14 66	0 119	1 580	1 706	13 98
4209 144	0 150	1 985	2 124	15 08	0 140	1 852	1 990	14 63	0 120	1 589	1 715	14 06
4216 136	0 147	1 940	2 079	14 76	0 138	1 820	1 958	14 39	0 118	1 559	1 685	13 81
4220 509	0 150	1 976	2 115	15 02	0 140	1 844	1 982	14 57	0 118	1 556	1 682	13 79
4232 887	0 149	1 954	2 093	14 86	0 140	1 835	1 973	14 50	0 120	1 574	1 700	13 94
4257 815	0 150	1 946	2 085	14 80	0 143	1 855	1 993	14 65	0 120	1 559	1 685	13 81
4258 477	0 150	1 946	2 085	14 80	0 140	1 816	1 954	14 36	0 120	1 559	1 685	13 81
4265 418	0 150	1 941	2 080	14 77	0 142	1 837	1 975	14 52	0 120	1 555	1 681	13 78
4266 081	0 150	1 941	2 080	14 77	0 141	1 824	1 962	14 42	0 121	1 567	1 693	13 88
4268 915	0 150	1 938	2 077	14 74	0 141	1 821	1 959	14 40	0 120	1 552	1 678	13.76
4276 836	0 151	1 945	2 084	14 80	0 141	1 816	1 954	14 36	0 120	1 547	1 673	13 71
4284 838	0 151	1 938	2 077	14 74	0 142	1 822	1 960	14 41	0 118	1 516	1 642	13 46
4287 566	0 150	1 924	2 063	14 65	0 140	1 796	1 934	14 21	0 118	1 515	1 641	13 45
4288 310	0 148	1 898	2 037	14 46	0 142	1 820	1 958	14 39	0 120	1 540	1 666	13 66
4290 377	0 148	1 896	2 035	14 45	0 140	1 793	1 931	14 19	0 119	1 526	1 652	13 54
4290 542	0 149	1 908	2 047	14 53	0 141	1 807	1 945	14 30	0 122	1 565	1.691	13 86
4291 630	0 150	1 921	2 060	14 62	0 140	1 793	1 931	14 19	0 120	1 539	1 665	13 65
4294 936	0 150	1 918	2 057	14 60	0 140	1 790	1 928	14 17	0 120	1 536	1 662	13 62

λ	$\phi = 44°8$				$\phi = 59°7$				$\phi = 74°2$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
4196 699	0 090	1 201	1 308	13 08	0 058	0 781	0 861	12 12	0 027	0 381	0 428	11 16
4197 257	0 088	1 173	1 280	12 80	0 060	0 808	0 888	12 50	0 030	0 423	0 470	12 25
4203 730	0 090	1 198	1 305	13 05	0 060	0 806	0 886	12 47	0 030	0 422	0 469	12 23
4209 144	0 089	1 182	1 289	12 89	0 060	0 806	0 886	12 47	0 034	0 477	0 524	13 66
4216 136	0 089	1 179	1 286	12 86	0 059	0 789	0 869	12 23	0 028	0 392	0 439	11 45
4220 509	0 090	1 190	1 297	12 97	0 058	0 774	0 854	12 02	0 031	0 433	0 480	12 52
4232 887	0 088	1 159	1 266	12 66	0 061	0 810	0 890	12 52	0 028	0 390	0 437	11 39
4257 815	0 091	1 185	1 292	12 92	0 061	0 802	0 882	12 41	0 033	0 454	0 501	13 06
4258 477	0 090	1 172	1 279	12 79	0 062	0 815	0 895	12 59	0 030	0 413	0 460	11 99
4265 418	0 088	1 143	1 250	12 50	0 060	0 787	0 867	12 20	0 028	0 384	0 431	11 24
4266 081	0 090	1 169	1 276	12 76	0 059	0 773	0 853	12 00	0 030	0 412	0 459	11 97
4268 915	0 091	1 181	1 288	12 88	0 060	0 786	0 866	12 19	0 030	0 411	0 458	11 94
4276 836	0 090	1 164	1 271	12 71	0 060	0 784	0 864	12 16	0 026	0 356	0 403	10 51
4284 838	0 089	1 147	1 254	12 54	0 060	0 781	0 861	12 12	0 030	0 409	0 456	11 89
4287 566	0 090	1 159	1 266	12 66	0 060	0 781	0 861	12 12	0 027	0 367	0 414	10 79
4288 310	0 090	1 159	1 266	12 66	0 060	0 780	0 860	12 10	0 030	0 409	0 456	11 89
4290 377	0 088	1 131	1 238	12 38	0 060	0 780	0 860	12 10	0 028	0 381	0 428	11 16
4290 542	0 089	1 145	1 252	12 52	0 059	0 765	0 845	11 89	0 030	0 408	0 455	11 86
4291 630	0 089	1 144	1 251	12 51	0 059	0 765	0 845	11 89	0 028	0.381	0 428	11 16
4294 936	0 090	1 155	1 262	12 62	0 060	0 778	0 858	12 07	0 027	0 366	0 413	10 77

The results for Plate ω 35 are given on page 34

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 36 1906, Nov 11, $10^h\,15^m$ G M T Measured by A on G Distance from Limb 2 2 mm Quality, good

		$\phi - P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	228 6	15 5	15 8	74 2	12 6	1 021
O−Ω	154 2	30 5	30 7	59 3	6 2	1 006
P	−22 6	45 5	45 4	44 6	4 6	1 003
D	3 1	60 5	60 6	29 4	3 6	1 002
Diameter	171 6 mm	75 5	75 5	14 5	3 2	1 002
Factor	1 027	90 5	90 5	−0 5	3 1	1 002

λ	$\phi = -0°5$				$\phi = 14°5$				$\phi = 29°4$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 148	1 929	2 070	14 70	0 143	1 865	2 005	14 70	0 119	1 552	1 682	13 69
4197 257	0 150	1 955	2 096	14 88	0 143	1 864	2 004	14 69	0 119	1 551	1 681	13 69
4203 730	0 151	1 963	2 104	14 94	0 141	1 834	1 974	14 47	0 120	1 560	1 690	13 76
4209 144	0 152	1 973	2 114	15 01	0 145	1 881	2 021	14 81	0 122	1 583	1 713	13 95
4216 136	0 151	1 954	2 095	14 87	0 144	1 864	2 004	14 69	0 120	1 553	1 683	13 70
4220 509	0 151	1 951	2 092	14 85	0 145	1 873	2 013	14 75	0 121	1 563	1 693	13 78
4232 887	0 151	1 942	2 083	14 79	0 145	1 865	2 005	14 70	0 122	1 568	1 698	13 82
4257 815	0 151	1 921	2 062	14 64	0 145	1 845	1 985	14 55	0 123	1 565	1 695	13 80
4258 477	0 153	1 947	2 088	14 82	0 145	1 845	1 985	14 55	0 121	1 539	1 669	13 59
4265 418	0 152	1 928	2 069	14 69	0 144	1 828	1 968	14 42	0 122	1 548	1 678	13 66
4266 081	0 152	1 928	2 069	14 69	0 145	1 840	1 980	14 51	0 120	1 523	1 653	13 46
4268 915	0 152	1 926	2 067	14 67	0 144	1 825	1 965	14 40	0 121	1 533	1 663	13 54
4276 836	0 151	1 908	2 049	14 55	0 146	1 844	1 984	14 54	0 121	1 528	1 658	13 50
4284 838	0 152	1 914	2 055	14 59	0 145	1 826	1 966	14 41	0 120	1 511	1 641	13 36
4287 566	0 151	1 900	2 041	14 49	0 143	1 799	1 939	14 21	0 121	1 522	1 652	13 45
4288 310	0 151	1 899	2 040	14 48	0 144	1 811	1 951	14 30	0 121	1 522	1 652	13 45
4290 377	0 152	1 910	2 051	14 56	0 145	1 821	1 961	14 37	0 120	1 508	1 638	13 34
4290 542	0 151	1 898	2 039	14 48	0 145	1 821	1 961	14 37	0 121	1 520	1 650	13 43
4291 630	0 150	1 884	2 025	14 38	0 145	1 821	1 961	14 37	0 122	1 532	1 662	13 53
4294 936	0 150	1 881	2 022	14 36	0 145	1 819	1 959	14 36	0 122	1 529	1 659	13 51

λ	$\phi = 44°6$				$\phi = 59°3$				$\phi = 74°2$			
4196 699	0 089	1 162	1 273	12 69	0 057	0 746	0 831	11 56	0 028	0 372	0 425	11 08
4197 257	0 089	1 161	1 272	12 68	0 058	0 758	0 843	11 72	0 030	0 398	0 451	11 76
4203 730	0 090	1 171	1 282	12 78	0 058	0 757	0 842	11 71	0 030	0 380	0 433	11 29
4209 144	0 089	1 155	1 266	12 62	0 060	0 782	0 867	12 06	0 030	0 396	0 449	11 71
4216 136	0 089	1 152	1 263	12 59	0 057	0 741	0 826	11 49	0 029	0 382	0 435	11 34
4220 509	0 089	1 150	1 261	12 57	0 060	0 778	0 863	12 00	0 030	0 395	0 448	11 68
4232 887	0 089	1 145	1 256	12 52	0 059	0 761	0 846	11 76	0 031	0 406	0 459	11 97
4257 815	0 090	1 146	1 257	12 53	0 062	0 792	0 877	12 20	0 032	0 415	0 468	12 17
4258 477	0 090	1 146	1 257	12 53	0 061	0 779	0 864	12 01	0 031	0 401	0 454	11 84
4265 418	0 089	1 130	1 241	12 37	0 060	0 764	0 869	12 08	0 033	0 427	0 480	12 52
4266 081	0 090	1 143	1 254	12 50	0 060	0 764	0 849	11 81	0 032	0 413	0 466	12 15
4268 915	0 089	1 129	1 240	12 36	0 059	0 750	0 835	11 61	0 032	0 413	0 466	12 15
4276 836	0 091	1 151	1 262	12 58	0 062	0 786	0 871	12 11	0 029	0 373	0 426	11 11
4284 838	0 090	1 134	1 245	12 41	0 060	0 758	0 833	11 58	0 031	0 397	0 450	11 73
4287 566	0 090	1 133	1 244	12 40	0 061	0 770	0 855	11 89	0 029	0 371	0 424	11 06
4288 310	0 089	1 121	1 232	12 28	0 061	0 769	0 854	11 88	0 032	0 410	0 463	12 07
4290 377	0 090	1 132	1 243	12 39	0 059	0 744	0 829	11 53	0 031	0 396	0 449	11 71
4290 542	0 090	1 132	1 243	12 39	0 060	0 757	0 842	11 71	0 030	0 383	0 436	11 37
4291 630	0 088	1 106	1 217	12 13	0 062	0 782	0 867	12 06	0 032	0 409	0 462	12 05
4294 936	0 091	1 142	1 253	12 49	0 060	0 755	0 840	11 68	0 033	0 422	0 475	12 39

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 37 1906, Nov 11, 10^h 40^m G M T Measured by A on G Distance from Limb 2 2 mm Quality, good.

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	228 6	15 7	16 0	74 0	11 5	1 021
O−Ω	154 2	30 7	30 8	59 2	6 2	1 006
P	−22 6	45 7	45 8	44 2	4 4	1 003
D	3 1	60 7	60 7	29 3	3 6	1 002
Diameter	171 6 mm	75 7	75 7	14 3	3 2	1 002
Factor	1 027	90 7	90 7	−0 7	3 1	1 002

λ	$\phi = -0°7$				$\phi = 14°3$				$\phi = 29°3$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 150	1 960	2 101	14 92	0 143	1 867	2 007	14 71	0 120	1 569	1 699	13 84
4197 257	0 149	1 942	2 083	14 79	0 142	1 850	1 990	14 59	0 121	1 574	1 704	13 88
4203 730	0 149	1 943	2 084	14 80	0 142	1 849	1 929	14 58	0 122	1 581	1 711	13 94
4209 144	0 152	1 968	2 119	15 04	0 142	1 843	1 973	14 46	0 122	1 578	1 708	13 92
4216 136	0 150	1 936	2 077	14 75	0 142	1 833	1 973	14 46	0 122	1 584	1 714	13 97
4220 509	0 151	1 953	2 094	14 87	0 142	1 835	1 975	14 48	0 122	1 571	1 701	13 86
4232 887	0 154	1 980	2 121	15 06	0 143	1 839	1 979	14 51	0 122	1 571	1 701	13 86
4257 815	0 152	1 934	2 075	14 73	0 143	1 814	1 954	14 32	0 122	1 552	1 682	13 71
4258 477	0 152	1 930	2 071	14 70	0 143	1 817	1 957	14 34	0 122	1 557	1 687	13 75
4265 418	0 150	1 908	2 049	14 55	0 143	1 812	1 952	14 31	0 122	1 548	1 678	13 67
4266 081	0 153	1 937	2 078	14 75	0 143	1 812	1 952	14 31	0 122	1 548	1 678	13 67
4268 915	0 153	1 942	2 083	14 79	0 143	1 815	1 955	14 33	0 122	1 546	1 676	13 66
4276 836	0 152	1 926	2 067	14 67	0 143	1 806	1 946	14 26	0 123	1 554	1 684	13 72
4284 838	0 152	1 909	2 050	14 55	0 144	1 810	1 950	14 29	0 123	1 556	1 686	13 74
4287 566	0 153	1 930	2 071	14 70	0 143	1 799	1 939	14 21	0 123	1 543	1.673	13 63
4288 310	0 152	1 916	2 057	14 60	0 143	1 798	1 938	14 20	0 123	1 545	1 675	13 65
4290 377	0 151	1 903	2 044	14 51	0 143	1 799	1 939	14 21	0 123	1 543	1 673	13 63
4290 542	0 152	1 915	2 056	14 60	0 143	1 795	1 935	14 18	0 123	1 546	1 676	13 66
4291 630	0 151	1 897	2 038	14 47	0 142	1 778	1 918	14 06	0 123	1 548	1 678	13 67
4294 936	0 152	1 901	2 042	14 50	0 142	1 780	1 920	14 07	0.122	1 534	1 664	13 56
	$\phi = 44°2$				$\phi = 59°2$				$\phi = 74°0$			
4196 699	0 090	1 174	1 285	12 72	0 062	0.806	0 891	12 35	0 030	0 404	0 457	11 77
4197 257	0 089	1 166	1 277	12 65	0 061	0 796	0 881	12 21	0 030	0 393	0 446	11 49
4203 730	0 089	1 166	1 277	12 65	0 062	0 814	0 899	12 46	0 031	0 411	0 464	11 95
4209 144	0 091	1 179	1 290	12 77	0 062	0 803	0 888	12 31	0 032	0 426	0 479	12 34
4216 136	0 090	1 171	1 282	12 70	0 061	0 793	0 878	12 17	0 031	0 414	0 467	12 03
4220 509	0 091	1 174	1 285	12 73	0 062	0 804	0 889	12 32	0 030	0 395	0 448	11 54
4232 887	0 092	1 190	1 301	12 89	0 062	0 806	0 891	12 35	0 032	0 420	0 473	12 18
4257 815	0 092	1 169	1 280	12 68	0 063	0 805	0 890	12 34	0 032	0 421	0 474	12 21
4258 477	0 088	1 126	1 237	12 25	0 064	0 822	0 907	12 57	0 032	0 415	0 468	12 05
4265 418	0 091	1 158	1 269	12 57	0 062	0 795	0 880	12 20	0 033	0 422	0 475	12.23
4266 081	0 090	1 148	1 259	12 47	0 061	0 775	0 860	11 92	0 031	0 404	0 457	11 77
4268 915	0 091	1 157	1 268	12 56	0 061	0 776	0 861	11 93	0 032	0 409	0 462	11 90
4276 836	0 090	1 133	1 244	12 32	0 062	0 781	0 866	12 00	0 030	0 391	0 444	11 44
4284 838	0 093	1 174	1 285	12 72	0 062	0 779	0 864	11 97	0 032	0 406	0 459	11 82
4287 566	0 090	1 128	1 239	12 27	0 062	0 786	0 871	12 07	0 032	0 415	0 468	12 05
4288 310	0 090	1 138	1 249	12 37	0 062	0 786	0 871	12 07	0 031	0 394	0 447	11 51
4290 377	0 089	1 117	1 228	12 16	0 062	0 777	0 862	11 95	0 032	0 405	0 458	11 80
4290 542	0 090	1 137	1 248	12 36	0 063	0 789	0 874	12 11	0 031	0 400	0 453	11 67
4291 630	0 091	1 149	1 260	12 48	0 062	0 782	0 867	12 02	0 032	0 405	0 458	11 80
4294 936	0 091	1 144	1 255	12 43	0 062	0 780	0 865	11 99	0 032	0 411	0 464	11 95

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 38 1906, Nov 11, 11h 0m G M T Measured by L on T Distance from Limb 2 2 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
☉	228 6	15 7	16 0	74 0	11 5	1 021
☉—☊	154 2	30 7	30 8	59 2	6 2	1 006
P	−22 6	45 7	45 8	44 2	4 4	1 003
D	3 1	60 7	60 7	29 3	3 6	1 002
Diameter	171 6 mm	75 7	75 7	14 3	3 2	1 002
Factor	1 027	90 7	90 7	−0 7	3 1	1 002

λ	$\phi = -0°7$				$\phi = 14°3$				$\phi = 29°3$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 148	1 926	2 067	14 68	0 138	1 798	1 938	14 20	0 116	1 511	1 641	13 36
4197 257	0 148	1 926	2 067	14 68	0 142	1 848	1 988	14 56	0 118	1 536	1 666	13 56
4203 730	0 152	1 974	2 115	15 02	0 145	1 883	2 023	14 82	0 122	1 586	1 716	13 97
4209 144	0 151	1 957	2 098	14 90	0 142	1 840	1 980	14 50	0 124	1 558	1 688	13 74
4216 136	0 148	1 914	2 055	14 59	0 137	1 771	1 911	14 00	0 118	1 520	1 656	13 48
4220 509	0 153	1 974	2 115	15 02	0 145	1 868	2 008	14 71	0 124	1 601	1 731	14 09
4232 887	0 150	1 928	2 069	14 69	0 140	1 801	1 941	14 22	0 120	1 542	1 672	13 61
4257 815	0 156	1 986	2 127	15 10	0 146	1 822	1 962	14 37	0 126	1 608	1 738	14 15
4258 477	0 148	1 884	2 025	14 38	0 142	1 804	1 944	14 24	0 121	1 540	1 670	13 60
4265 418	0 152	1 928	2 069	14 69	0 144	1 826	1 966	14 40	0 122	1 548	1 678	13 66
4266 081	0 156	1 978	2 119	15 04	0 148	1 874	2 014	14 76	0 124	1 568	1 698	13 82
4268 915	0 150	1 901	2 042	14 50	0 142	1 797	1 937	14 19	0 119	1 508	1 638	13 33
4276 836	0 156	1 970	2 111	14 99	0 143	1 807	1 947	14 26	0 121	1 529	1 659	13 51
4284 838	0 153	1 930	2 071	14 70	0 142	1 790	1 930	14 40	0 120	1 513	1 643	13 38
4287 566	0 155	1 950	2 091	14 85	0 145	1 828	1 968	14 42	0 122	1 537	1 667	13 57
4288 310	0 154	1 940	2 081	14 78	0 147	1 848	1 988	14 56	0 124	1 561	1 691	13 77
4290 377	0 156	1 963	2 104	14 94	0 140	1 762	1 902	13 94	0 123	1 547	1 677	13 65
4290 542	0 151	1 899	2 040	14 48	0 144	1 812	1 952	14 30	0 120	1 511	1 641	13 36
4291 630	0 154	1 935	2 076	14 74	0 140	1 762	1 902	13 94	0 124	1 559	1 689	13 75
4294 936	0 155	1 947	2 088	14 82	0 146	1 832	1 972	14 45	0 123	1 544	1 674	13 63

λ	$\phi = 44°2$				$\phi = 59°2$				$\phi = 74°0$			
4196 699	0 088	1 149	1 260	12 48	0 059	0 772	0 857	11 88	0 029	0 382	0 435	11 20
4197 257	0 091	1 185	1 296	12 83	0 060	0 782	0 867	12 02	0 030	0 393	0 446	11 49
4203 730	0 092	1 198	1 309	12 96	0 066	0 855	0 940	13 03	0 036	0 463	0 516	13 29
4209 144	0 094	1 221	1 332	13 19	0 062	0 805	0 890	12 34	0 034	0 445	0 498	12 83
4216 136	0 088	1 140	1 251	12 39	0 060	0 780	0 865	11 99	0 031	0 403	0 456	11 75
4220 509	0 093	1 192	1 303	12 90	0 062	0 804	0 889	12 34	0 036	0 461	0 514	13 24
4232 887	0 091	1 164	1 275	12 63	0 064	0 823	0 908	12 59	0 035	0 457	0 510	13 14
4257 815	0 093	1 178	1 289	12 77	0 066	0 844	0 929	12 88	0 035	0 454	0 507	13 06
4258 477	0 092	1 168	1 279	12 67	0 066	0 839	0 924	12 81	0 034	0 438	0 491	12 65
4265 418	0 093	1 176	1 287	12 74	0 063	0 798	0 883	12 24	0 033	0 428	0 481	12 39
4266 081	0 092	1 166	1 277	12 65	0 065	0 827	0 912	12 64	0 032	0 413	0 466	12 00
4268 915	0 091	1 154	1 265	12 53	0 062	0 787	0 872	12 08	0 036	0 463	0 516	13 29
4276 836	0 093	1 173	1 284	12 71	0 063	0 796	0 881	12 21	0 032	0 411	0 464	11 95
4284 838	0 092	1 161	1 272	12 60	0 063	0 794	0 879	12 18	0 034	0 436	0 489	12 60
4287 566	0 094	1 181	1 292	12 79	0 065	0 823	0 908	12 59	0 032	0 410	0 463	11 93
4288 310	0 094	1 181	1 292	12 79	0 065	0 819	0 904	12 53	0 038	0 483	0 536	13 82
4290 377	0 093	1 170	1 281	12 69	0 064	0 808	0 893	12 38	0 034	0 436	0 489	12 60
4290 542	0 093	1 170	1 281	12 69	0 063	0 794	0 879	12 18	0 031	0 395	0 448	11 54
4291 630	0 092	1 159	1 270	12 58	0 062	0 783	0 868	12 03	0 035	0 443	0 496	12 78
4294 936	0 093	1 168	1 279	12 67	0 070	0 880	0 965	13 38	0 033	0 420	0 473	12 18

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 39 1906, Nov 11, 11ʰ 15ᵐ G M T Measured by L. on T Distance from Limb 2 2 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
☉	228 7	15 7	16 0	74 0	11 6	1 021
☉−Ω	154 3	30 7	30 8	59 2	6 1	1 006
P	−22 6	45 7	45 8	44 2	4 4	1 003
D	3 1	60 7	60 7	29 3	3 6	1 002
Diameter	171 6 mm	75 7	75 7	14 3	3 2	1 002
Factor	1 027	90 7	90 7	−0 7	3 1	1 002

λ	$\phi = -0°7$				$\phi = 14°3$				$\phi = 29°3$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 150	1 950	2 091	14 85	0 135	1 758	1 898	13 91	0 118	1 536	1 666	13 56
4197 257	0 150	1 950	2 091	14 85	0 137	1 782	1 922	14 08	0 119	1 548	1 678	13 66
4203 730	0 152	1 977	2 118	15 04	0 141	1 828	1 968	14 42	0 120	1 560	1 690	13 76
4209 144	0 151	1 957	2 098	14 90	0 143	1 847	1 987	14 56	0 122	1 584	1 714	13 95
4216 136	0 147	1 903	2 044	14 51	0 142	1 837	1 977	14 48	0 118	1 526	1 656	13 48
4220 509	0 154	1 988	2 129	15 12	0 144	1 853	1 993	14 60	0 125	1 616	1 746	14 21
4232 887	0 153	1 964	2 105	14 94	0 143	1 837	1 977	14 48	0 122	1 567	1 697	13 82
4257 815	0 151	1 924	2 065	14 66	0 144	1 834	1 974	14 46	0 126	1 605	1 735	14 12
4258 477	0 153	1 947	2 088	14 82	0 142	1 818	1 958	14 34	0 122	1 554	1 684	13 71
4265 418	0 152	1 931	2 072	14 71	0 146	1 844	1 984	14 35	0 121	1 537	1 667	13 57
4266 081	0 156	1 978	2 119	15 04	0 144	1 819	1 959	14 35	0 126	1 598	1 728	14 07
4268 915	0 156	1 977	2 118	15 04	0 144	1 820	1 960	14 36	0 122	1 548	1 678	13 66
4276 836	0 152	1 919	2 060	14 63	0 143	1 799	1 939	14 21	0 123	1 555	1 685	13 72
4284 838	0 153	1 926	2 067	14 68	0 146	1 835	1 975	14 47	0 124	1 563	1 693	13 78
4287 566	0 156	1 964	2 105	14 94	0 145	1 825	1 965	14 40	0 123	1 549	1 679	13 69
4288 310	0 154	1 937	2 078	14 75	0 144	1 820	1 960	14 36	0 121	1 522	1 652	13 45
4290 377	0 153	1 923	2 064	14 65	0 144	1 819	1 959	14 35	0 121	1 521	1 651	13 44
4290 542	0 152	1 913	2 054	14 58	0 148	1 859	1 999	14 65	0 124	1 561	1 691	13.77
4291 630	0 155	1 947	2 088	14 82	0 144	1 818	1 958	14 35	0 121	1 521	1 651	13 44
4294 936	0 154	1 932	2 073	14 72	0 145	1 819	1 959	14 35	0 123	1 546	1 676	13 64

λ	$\phi = 44°2$				$\phi = 59°2$				$\phi = 74°0$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
4196 699	0 088	1 170	1 281	12 68	0 059	0 772	0 857	11 88	0 030	0 398	0 451	11 52
4197 257	0 088	1 170	1 281	12 68	0 060	0 792	0 877	12 16	0 029	0 387	0 440	11 33
4203 730	0 092	1 195	1 306	12 93	0 063	0 821	0 906	12 56	0 034	0 448	0 501	12 90
4209 144	0 095	1 231	1 342	13 39	0 064	0 831	0 916	12 70	0 034	0 446	0 499	12 85
4216 136	0 089	1 153	1 264	12 51	0 061	0 790	0 875	12 13	0 030	0 400	0 453	11 67
4220 509	0 093	1 196	0 307	12 94	0 064	0 829	0 914	12 67	0 033	0 436	0 489	12 60
4232 887	0 092	1 178	1 289	12 76	0 063	0 812	0 897	12 43	0 036	0 470	0 523	13 47
4257 815	0 094	1 192	1 303	12 90	0 066	0 839	0 924	12 81	0 038	0 453	0 506	13 03
4258 477	0 093	1 182	1 293	12 80	0 064	0 818	0 903	12 52	0 033	0 427	0 480	12 36
4265 418	0 093	1 180	1 291	12 78	0 064	0 817	0 902	12 50	0 033	0 427	0 480	12 36
4266 081	0 093	1 180	1 291	12 78	0 066	0 838	0 923	12 80	0 035	0 452	0 505	13 01
4268 915	0 092	1 168	1 279	12 67	0 064	0 812	0 897	12 43	0 033	0 426	0 479	12 34
4276 836	0 094	1 187	1 298	12 85	0 063	0 798	0 883	12 24	0 036	0 461	0 514	13 24
4284 838	0 094	1 185	1 296	12 83	0 063	0 796	0 881	12 21	0 034	0 436	0 489	12 60
4287 566	0 093	1 174	1 285	12 72	0 065	0 820	0 905	12 54	0 036	0 460	0 513	13 21
4288 310	0 092	1 160	1 271	12 58	0 064	0 809	0 894	12 39	0 036	0 460	0 513	13 21
4290 377	0 091	1 144	1 255	12 43	0 064	0 809	0 894	12 39	0 032	0 410	0 463	11 93
4290 542	0 093	1 170	1 281	12 69	0 063	0 795	0 880	12 20	0 032	0 410	0 463	11.93
4291 630	0 094	1 183	1 294	12 81	0 066	0 829	0 914	12 67	0 035	0 446	0 499	12 85
4294 936	0 097	1 218	1 329	13 16	0 064	0 804	0 889	12 32	0 035	0 446	0 499	12 85

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 35. 1906, Nov 11, 10h 0m G M T Measured by L on T Distance from Limb 2 2 mm Quality, good

		$p-P$	π	ϕ	η	sec η		
	°	°	°	°	°			°
☉	228 6	15 5	15 8	74 2	12 6	1 021	D	3 1
☉–☊	154 2	90 5	90 5	−0 5	3 1	1 002	Diameter	171 6 mm
P	−22 6						Factor	1 027

λ	$\phi = -0°5$				$\phi = 74°2$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°
4196 699	0 148	1 925	2 066	14 67	0 029	0 386	0 439	11 45
4197 257	0 150	1 950	2 091	14 85	0 030	0 397	0 450	11 73
4203 730	0 153	1 987	2 128	15 11	0 033	0 436	0 489	12 75
4209 144	0 154	1 995	2 136	15 16	0 035	0 462	0 515	13 43
4216 136	0 149	1 876	2 017	14 32	0 030	0 395	0 448	11 68
4220 509	0 153	1 974	2 115	15 02	0 032	0 420	0 473	12 33
4232 887	0 153	1 967	2 108	14 97	0 033	0 430	0 483	12 60
4257 815	0 155	1 973	2 114	15 01	0 034	0 437	0 490	12 78
4258 477	0 151	1 923	2 064	14 65	0 035	0 452	0 505	13 17
4265 418	0 152	1 927	2 068	14 68	0 034	0 436	0 489	12 75
4266 081	0 153	1 940	2 081	14 78	0 034	0 436	0 489	12 75
4268 915	0 152	1 925	2 066	14 67	0 034	0 436	0 489	12 75
4276 836	0 152	1 922	2 063	14 65	0 034	0 436	0 489	12 75
4284 838	0 154	1 943	2 084	14 79	0 033	0 425	0 478	12 46
4287 566	0 153	1 925	2 066	14 67	0 034	0 435	0 488	12 73
4288 310	0 154	1 938	2 079	14 76	0 034	0 435	0 488	12 73
4290 377	0 150	1 888	2 029	14 41	0 034	0 435	0 488	12 73
4290 542	0 153	1 923	2 064	14 65	0 035	0 445	0 498	12 99
4291 630	0 153	1 922	2 063	14 65	0 033	0 421	0 474	12 36
4294 936	0 154	1 931	2 072	14 71	0 033	0 420	0 473	12 33

Plate ω 39½ 1906, Dec 18, 5h 50m G M T Measured by L on T Distance from Limb 4 1 mm Quality, good

		$p-P$	π	ϕ	η	sec η		
	°	°	°	°	°			°
☉	265 9	59 9	59 9	30 1	1 7	1 000	D	−1 5
☉–☊	191 5	74 9	74 9	15 1	1 5	1 000	Diameter	175 2 mm
P	−8 8	89 9	89 9	0 1	1 4	1 000	Factor	1 049

λ	$\phi = 0°1$				$\phi = 15°1$				$\phi = 30°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 148	1 963	2 104	14 94	0 138	1 833	1 973	14 52	0 119	1 577	1 707	14 02
4197 257	0 148	1 963	2 104	14 94	0 138	1 833	1 973	14 52	0 120	1 587	1 717	14 10
4203 730	0 150	1 985	2 126	15 09	0 141	1 837	1 977	14 54	0 119	1 575	1 705	14 00
4209 144	0 153	2 021	2 162	15 35	0 142	1 871	2 011	14 79	0 122	1 594	1 724	14 16
4216 136	0 146	1 926	2 067	14 67	0 139	1 836	1 976	14 54	0 118	1 556	1 686	13 85
4220 509	0 151	1 974	2 115	15 02	0 141	1 855	1 995	14 68	0 122	1 586	1 716	14 09
4232 887	0 150	1 958	2 099	14 90	0 142	1 846	1 986	14 61	0 122	1 582	1 712	14 06
4257 815	0 150	1 947	2 088	14 82	0 144	1 868	2 008	14 77	0 124	1 597	1 727	14 19
4258.477	0 150	1 946	2 087	14 82	0 141	1 823	1 963	14 44	0 120	1 552	1 682	13 82
4265 418	0 152	1 965	2 106	14 95	0 142	1 831	1 971	14 50	0 123	1 584	1 714	14 08
4266 081	0 156	2 016	2 157	15 31	0 143	1 850	1 990	14 64	0 121	1 563	1 693	13 91
4268 915	0 149	1 924	2 065	14 66	0 140	1 805	1 945	14 31	0 122	1 566	1 696	13 93
4276 836	0 152	1 956	2 097	14 89	0 142	1 823	1 963	14 44	0 123	1 580	1 710	14 05
4284.838	0 153	1 963	2 104	14 94	0 145	1 860	2 000	14 71	0 121	1 556	1 686	13 85
4287 566	0 153	1 967	2 108	14 97	0 144	1 848	1 988	14 63	0 122	1 562	1 692	13 90
4288 310	0 154	1 972	2 113	15 00	0 141	1 808	1 948	14 33	0 124	1 587	1 717	14 10
4290 377	0 151	1 933	2 074	14 72	0 141	1 810	1 950	14 35	0 120	1 537	1 667	13 69
4290 542	0 150	1 922	2 063	14 65	0 145	1 858	1 998	14 70	0 125	1 599	1 729	14 20
4291 630	0 152	1 949	2 090	14 84	0 140	1 796	1 936	14 24	0 123	1 575	1 705	14 00
4294.936	0 153	1 959	2 100	14 91	0 142	1 815	1 955	14 38	0 122	1 560	1 690	13 88

TABLE 4.—RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907—Continued

Plate ω 40 1906, Dec 18, $6^h\ 40^m$ G M T Measured by L on T. Distance from Limb 4.1 mm. Quality, good.

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	265 9	59 9	59 9	30 1	1 7	1 000
O−Ω	191 5	74 9	74 9	15 1	1 5	1 000
P	−8 8	89 9	89 9	0 1	1 4	1 000
D	−1 5					
Diameter	175 6 mm					
Factor	1 049					

λ	$\phi = 0°1$				$\phi = 0°1$				$\phi = 15°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 148	1 964	2 105	14 94	0 150	1 990	2 131	15 13	0 138	1 833	1 973	14.50
4197 257	0 148	1 964	2 105	14 94	0 150	1 990	2 131	15 13	0 139	1 843	1 983	14 58
4203 730	0 152	2 013	2 154	15 29	0 149	1 975	2 116	15 02	0 141	1 863	2 003	14 72
4209 144	0 149	1 966	2 107	14 96	0 150	1 984	2 125	15 09	0 141	1 805	1 945	14 30
4216 136	0 151	1 986	2 127	15 10	0 148	1 951	2 092	14 85	0 141	1 858	1 998	14 68
4220 509	0 150	1 975	2 116	15 02	0 152	2 001	2 142	15 21	0 140	1 841	1 981	14 56
4232 887	0 149	1 954	2 095	14 87	0 150	1 966	2.107	14.96	0 141	0 846	1 986	14 60
4257 815	0 152	1 969	2 110	14 98	0 155	2 013	2.154	15 29	0 142	1 843	1 983	14 58
4258 477	0 152	1 968	2 109	14 97	0 149	1 936	2 077	14 74	0 139	1 802	1 942	14 27
4265 418	0 150	1 940	2 081	14 77	0 151	1 954	2 095	14 87	0 143	1 851	1 991	14 63
4266 081	0 153	1 976	2 117	15 03	0 152	1 960	2 101	14 92	0 143	1 850	1 990	14 63
4268 915	0 152	1 959	2 100	14 91	0 150	1 938	2 079	14 76	0 143	1 849	1 989	14 62
4276 836	0 153	1 971	2 112	14 99	0 151	1 945	2 086	14 81	0 144	1 853	1 993	14 65
4284 838	0 152	1 953	2 094	14 87	0 152	1 953	2 094	14 87	0 142	1 824	1 964	14 44
4287 566	0 148	1 900	2 041	14 49	0 152	1 951	2 092	14 85	0 140	1 797	1 937	14 24
4288 310	0 151	1 937	2 078	14 75	0.156	1 998	2 139	15 18	0 143	1.848	1 988	14 61
4290 377	0 152	1 947	2 088	14 82	0 151	1 936	2 077	14 74	0 140	1 796	1 936	14.23
4290 542	0 150	1 921	2 062	14 64	0 151	1 936	2 077	14 74	0 144	1 844	1 984	14.58
4291 630	0 150	1 921	2 062	14 64	0 152	1.946	2 087	14 81	0 141	1 806	1 946	14.30
4294 936	0 152	1 945	2 086	14 81	0 150	1 919	2 060	14 62	0 143	1 831	1.971	14.49
	$\phi = 15°1$				$\phi = 30°1$				$\phi = 30°1$			
4196 699	0 139	1 843	1 983	14 58	0 120	1 592	1 722	14 13	0.119	1 581	1 711	14 04
4197 257	0 140	1 859	1 999	14 69	0 119	1 578	1 708	14 02	0 123	1 633	1 763	14.47
4203 730	0 141	1 867	2 007	14 75	0 123	1 631	1 761	14 45	0 122	1 616	1 746	14 33
4209 144	0 143	1 887	2 027	14 90	0 122	1 610	1 740	14 28	0 120	1 584	1 714	14 06
4216 136	0 140	1 843	1 983	14 58	0 117	1 541	1 671	13 71	0 118	1 556	1 686	13 84
4220 509	0 140	1 841	1 981	14 56	0 121	1 591	1 721	14 12	0 120	1 580	1 710	14 03
4232 887	0 143	1 872	2 012	14 79	0 120	1 561	1 691	13 88	0 122	1 597	1 727	14 17
4257 815	0 141	1 828	1 968	14 46	0 121	1 559	1 689	13 86	0 122	1 585	1 715	14.07
4258 477	0 140	1 813	1 953	14 35	0 124	1 607	1 737	14 25	0 122	1 581	1 711	14 04
4265 418	0 141	1 825	1 965	14 44	0 121	1 560	1 690	13 87	0 124	1 604	1 734	14 23
4266 081	0 140	1 810	1 950	14 33	0 124	1 604	1 734	14 23	0 123	1 589	1 719	14 11
4268 915	0 142	1 834	1 974	14 51	0 120	1 547	1 677	13 76	0 123	1 588	1 718	14 10
4276 836	0 145	1 871	2 011	14 78	0 122	1 570	1 700	13 95	0 122	1 566	1 696	13 92
4284 838	0 140	1 799	1 939	14 25	0 121	1 552	1 682	13 80	0 121	1 552	1 682	13 80
4287 566	0 144	1 848	1 988	14 61	0 121	1 551	1 681	13 79	0 122	1 563	1 693	13 89
4288 310	0 141	1 808	1 948	14 32	0 120	1 540	1 670	13 70	0 122	1 562	1 692	13·88
4290 377	0 140	1 796	1 936	14 23	0 119	1 525	1 655	13 58	0 120	1 540	1 670	13 70
4290 542	0 140	1 796	1 936	14 23	0 121	1 550	1 680	13 79	0 117	1 499	1 629	13 37
4291 630	0 147	1 884	2 024	14 88	0 121	1 550	1 680	13 79	0 121	1 550	1 680	13.79
4294 936	0 142	1 815	1 955	14 37	0 122	1 560	1 690	13 87	0 122	1 560	1.690	13.87

TABLE 4 —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 41 1906, Dec 18, 6h 50m G M T Measured by L on T Distance from Limb 4 1 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	265 9	59 9	59 9	30 1	1 7	1 000
O−☊	191 5	74 9	74 9	15 1	1 5	1 000
P	−8 8	89 9	89 9	0 1	1 4	1 000
D	−1 5					
Diameter	175 6 mm					
Factor	1 049					

λ	$\phi = 0°1$				$\phi = 0°1$				$\phi = 15°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 145	1 927	2 068	14 68	0 145	1 927	2 068	14 68	0 136	1 806	1 946	14 30
4197 257	0 146	1 938	2 079	14 76	0 144	1 913	2 054	14 58	0 138	1 832	1 972	14 49
4203 730	0 147	1 946	2 087	14 82	0 147	1 946	2 087	14 82	0 141	1 861	2 001	14 71
4209 144	0 148	1 958	2 099	14 90	0 148	1 954	2 095	14 87	0 140	1 794	1 934	14 21
4216 136	0 146	1 926	2 067	14 67	0 145	1 912	2 053	14 58	0 138	1 820	1 960	14 41
4220 509	0 148	1 949	2 090	14 84	0 148	1 945	2 086	14 81	0 141	1 856	1 990	14 63
4232 887	0 150	1 965	2 106	14 95	0 150	1 965	2 106	14 95	0 139	1 818	1 958	14 39
4257 815	0 153	1 985	2 126	15 09	0 150	1 946	2 087	14 82	0 141	1 828	1 968	14 46
4258 477	0 148	1 922	2 063	14 65	0 150	1 946	2 087	14 82	0 140	1 813	1 953	14 35
4265 418	0 152	1 969	2 110	14 98	0 152	1 968	2 109	14 97	0 142	1 836	1 976	14 52
4266 081	0 151	1 954	2 095	14 87	0 148	1 919	2 060	14 63	0 142	1 836	1 976	14 52
4268 915	0 151	1 952	2 093	14 86	0 149	1 928	2 069	14 69	0 142	1 835	1 975	14 52
4276 836	0 152	1 960	2 101	14 92	0 152	1 959	2 100	14 91	0 141	1 817	1 957	14 38
4284 838	0 150	1 928	2 069	14 69	0 150	1 928	2 069	14 69	0 142	1 807	1 947	14 31
4287 566	0 151	1 937	2 078	14 75	0 150	1 923	2 064	14 65	0 141	1 809	1 949	14 32
4288 310	0 152	1 951	2 092	14 85	0 151	1 933	2 074	14 72	0 140	1 794	1 934	14 21
4290 377	0 151	1 936	2 077	14 75	0 149	1 912	2 053	14 58	0 142	1 803	1 943	14 28
4290 542	0 151	1 936	2 077	14 75	0 150	1 922	2 063	14 65	0 140	1 792	1 932	14 20
4291 630	0 151	1 936	2 077	14 75	0 150	1 922	2 063	14 65	0 141	1 807	1 947	14 31
4294 936	0 151	1 934	2 075	14 74	0 152	1 945	2 086	14 81	0 140	1 791	1 931	14 19

λ	$\phi = 15°1$				$\phi = 30°1$				$\phi = 30°1$			
4196 699	0 136	1 806	1 946	14 30	0 121	1 607	1 737	14 25	0 115	1 525	1 655	13 58
4197 257	0 136	1 806	1 946	14 30	0 121	1 607	1 737	14 25	0 117	1 551	1 681	13 79
4203 730	0 139	1 840	1 980	14 55	0 120	1 590	1 720	14 11	0 119	1 574	1 704	13 98
4209 144	0 140	1 848	1 988	14 61	0 118	1 558	1 688	13 85	0 119	1 572	1 702	13 97
4216 136	0 137	1 805	1 945	14 30	0 118	1 556	1 686	13 84	0 116	1 529	1 659	13 61
4220 509	0 138	1 814	1 954	14 36	0 118	1 554	1 684	13 82	0 120	1 578	1 708	14 02
4232 887	0 141	1 794	1 934	14 21	0 120	1 571	1 701	13 96	0 119	1 561	1 691	13 88
4257 815	0 142	1 843	1 983	14 58	0 122	1 585	1 715	14 07	0 120	1 554	1 684	13 82
4258 477	0 140	1 812	1 952	14 34	0 123	1 591	1 721	14 12	0 121	1 565	1 695	13 91
4265 418	0 140	1 809	1 949	14 32	0 121	1 567	1 697	13 93	0 120	1 552	1 682	13 80
4266 081	0 141	1 826	1 966	14 45	0 121	1 567	1 697	13 93	0 122	1 576	1 706	14 00
4268 915	0 141	1 824	1 964	14 44	0 123	1 588	1 718	14 10	0 120	1 551	1 681	13 79
4276 836	0 142	1 832	1 972	14 49	0 122	1 574	1 704	13 98	0 123	1 583	1 713	14 06
4284 838	0 143	1 839	1 979	14 55	0 122	1 567	1 697	13 93	0 119	1 530	1 660	13 62
4287 566	0 141	1 807	1 947	14 31	0 122	1 566	1 696	13 92	0 122	1 571	1 701	13 96
4288 310	0 141	1 807	1 947	14 31	0 124	1 591	1 721	14 12	0 121	1 562	1 692	13 88
4290 377	0 142	1 819	1 959	14 40	0 123	1 577	1 707	14 01	0 121	1 562	1 692	13 88
4290 542	0 142	1 819	1 959	14 40	0 122	1 566	1 696	13 92	0 123	1 575	1 705	13 99
4291 630	0 142	1 817	1 957	14 38	0 118	1 514	1 644	13 49	0 122	1 565	1 695	13 91
4294 936	0 143	1 831	1 971	14 49	0 122	1 560	1 690	13 87	0 122	1 564	1 694	13 90

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 46 1906, Dec 18, 10ʰ 30ᵐ G M T Measured by L on T Distance from Limb 4 1 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	266 1	30 6	30 6	59 4	2 9	1 001
O−Ω	191 7	45 6	45 6	44 4	2 1	1 001
P	−8 8					
D	−1 5					
Diameter	175 0 mm					
Factor	1 047					

λ	$\phi = 44°4$				$\phi = 44°4$				$\phi = 44°4$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 088	1 168	1 281	12 73	0 086	1 138	1 251	12 43	0 088	1 164	1 277	12 69
4197 257	0 088	1 168	1 281	12 73	0 088	1 163	1 276	12 68	0 089	1 178	1 291	12 83
4203 730	0 090	1 187	1 300	12 92	0 090	1 187	1 300	12 92	0 092	1 216	1 329	13 21
4209 144	0 090	1 186	1 299	12 91	0 090	1 186	1 299	12 91	0 092	1 211	1 324	13 16
4216 136	0 089	1 170	1 283	12 75	0 091	1 198	1 311	13 03	0 088	1 159	1 272	12 64
4220 509	0 091	1 193	1 306	12 98	0 091	1 197	1 310	13 02	0 092	1 208	1 321	13 13
4232 887	0 092	1 201	1 314	13 06	0 093	1 215	1 328	13 20	0 090	1 176	1 289	12 81
4257 815	0 093	1 205	1 318	13 10	0 093	1 204	1 317	13 09	0 092	1 189	1 302	12 94
4258 477	0 092	1 187	1 300	12 92	0 093	1 204	1 317	13 09	0 090	1 165	1 278	12 70
4265 418	0 095	1 226	1 339	13 31	0 094	1 209	1 322	13 14	0 093	1 199	1 312	13 04
4266 081	0 092	1 185	1 298	12 90	0 092	1 185	1 298	12 90	0-092	1 188	1 301	12 93
4268 915	0 092	1 182	1 295	12 87	0 092	1 184	1 297	12 89	0 093	1 198	1 311	13 02
4276 836	0 091	1 171	1 284	12 76	0 093	1 196	1 309	13 01	0 092	1 185	1 298	12 90
4284 838	0 092	1 180	1 293	12 84	0 092	1 180	1 293	12 85	0 090	1 159	1 272	12 64
4287 566	0 096	1 231	1 344	13 35	0 092	1 179	1 292	12 84	0 092	1 179	1 292	12 84
4288 310	0 090	1 154	1 267	12 59	0 092	1 179	1 292	12 84	0 091	1 168	1 281	12 73
4290 377	0 090	1 149	1 262	12 54	0 093	1 163	1 276	12 68	0 090	1 154	1.277	12 69
4290 542	0 089	1 139	1 252	12 44	0 091	1.149	1 262	12 54	0 092	1 178	1 291	12 83
4291 630	0 091	1 164	1 279	12 71	0 092	1 178	1 291	12 83	0 091	1 167	1 280	12 72
4294 936	0 092	1 177	1 290	12 82	0 094	1 198	1 311	13 03	0 092	1 177	1 290	12 82
	$\phi = 59°4$				$\phi = 59°4$				$\phi = 59°4$			
4196 699	0 058	0 766	0 852	11 88	0 058	0 768	0 854	11 91	0 060	0 793	0 879	12 26
4197 257	0 056	0 736	0 822	11 46	0 061	0 804	0 890	12 41	0 057	0 757	0 843	11 76
4203 730	0 060	0 792	0 878	12 25	0 061	0 803	0 889	12 40	0 064	0 844	0 930	12 97
4209 144	0 062	0 816	0 902	12 58	0 062	0 816	0 902	12 58	0 062	0 816	0 902	12 58
4216 136	0 060	0 790	0 876	12 22	0 061	0 801	0 887	12 37	0 058	0 764	0 850	11 85
4220 509	0 062	0 814	0 900	12 55	0 062	0 814	0 900	12 55	0 061	0 803	0 889	12 40
4232 887	0 062	0 812	0 898	12 52	0 063	0 822	0 908	12 66	0 065	0 848	0 934	13 03
4257 815	0 064	0 828	0 914	12 74	0 064	0 825	0 911	12 71	0 062	0 802	0 888	12 38
4258 477	0 061	0 793	0 879	12 26	0 062	0 800	0 886	12 36	0 062	0 839	0 925	12 90
4265 418	0 065	0 847	0 933	13 01	0 061	0 788	0 874	12 19	0 064	0 829	0 915	12 76
4266 081	0 064	0 827	0 913	12 73	0 064	0 824	0 910	12 69	0 065	0 839	0 925	12 90
4268 915	0 063	0 812	0 892	12 44	0 065	0 838	0 924	12 89	0 063	0 809	0 875	12 20
4276 836	0 062	0 802	0 888	12 38	0 062	0 797	0 883	12 32	0 062	0 797	0 883	12 32
4284 838	0 061	0 788	0 874	12 19	0 065	0 831	0 917	12 79	0 063	0 806	0 892	12 44
4287 566	0 063	0 809	0 895	12 48	0 063	0 805	0 891	12 43	0 061	0 781	0 867	12 09
4288 310	0 062	0 795	0 881	12 29	0 064	0 820	0 906	12 64	0 062	0 795	0 881	12 29
4290 377	0 060	0 770	0 856	11 94	0 062	0 794	0 880	12 27	0 063	0 805	0 891	12 43
4290 542	0 061	0 784	0 870	12 13	0 062	0 794	0 880	12 27	0 063	0 805	0 891	12.43
4291 630	0 062	0 794	0 880	12 27	0 063	0 804	0 890	12 41	0 062	0 794	0 880	12 27
4294 936	0 062	0 794	0 880	12 27	0 061	0 780	0 866	12 08	0 063	0 804	0 890	12 41

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 47. 1906, Dec 18, $10^h 50^m$ G M T Measured by L on T Distance from Limb 3 9 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	266 1	30 6	30 6	59 4	2 9	1 001
O − Ω	191 7	38 1	38 1	51 9	2 4	1 001
P	−8 8	45 6	45 6	44 4	2 1	1 001
D	−1 5	54 6	54 6	35 4	1 8	1 000
Diameter	175 0 mm					
Factor	1 047					

λ	$\phi = 35°4$				$\phi = 35°4$				$\phi = 44°4$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 106	1 410	1 535	13 37	0 101	1 386	1 511	13 16	0 086	1 169	1 282	12 74
4197 257	0 107	1 417	1 542	13 43	0 103	1 366	1 491	12 99	0 088	1 169	1 282	12 74
4203 730	0 105	1 386	1 511	13 16	0 108	1 427	1 552	13 52	0 092	1 207	1 320	13 12
4209 144	0 108	1 426	1 551	13 51	0 106	1 398	1 523	13 26	0 091	1 197	1 310	13 02
4216 136	0 109	1 434	1 559	13 58	0 102	1 392	1 517	13 21	0 090	1 185	1 298	12 90
4220 509	0 108	1 418	1 543	13 44	0 106	1 391	1 516	13 20	0 092	1 209	1 322	13 14
4232 887	0 108	1 415	1 540	13 41	0 104	1 405	1 530	13 33	0 091	1 187	1 300	12 92
4257 815	0 108	1 400	1 525	13 28	0 108	1 397	1 522	13 26	0 092	1 205	1 315	13 07
4258 477	0 109	1 410	1 535	13 37	0 107	1 386	1 511	13 16	0 092	1 202	1 315	13 07
4265 418	0 109	1 408	1 533	13 35	0 108	1 394	1 519	13 23	0 095	1 224	1 337	13 29
4266 081	0 111	1 432	1 557	13 56	0 106	1 369	1 494	13 01	0 093	1 200	1 313	13 05
4268 915	0 112	1 445	1 570	13 67	0 108	1 393	1 518	13 22	0 093	1 199	1 312	13 04
4276 836	0 114	1 464	1 589	13 84	0 110	1 415	1 540	13 41	0 094	1 207	1 320	13 12
4284 838	0 110	1 410	1 535	13 37	0 111	1 426	1 551	13 51	0 094	1 204	1 317	13 09
4287 566	0 109	1 395	1 520	13 24	0 107	1 370	1 495	13 02	0 092	1 180	1 293	12 85
4288 310	0 108	1 385	1 510	13 15	0 108	1 384	1 509	13 14	0 096	1 229	1 342	13 34
4290 377	0 108	1 384	1 509	13 14	0 109	1 395	1 520	13 24	0 092	1 179	1 292	12 84
4290 542	0 108	1 384	1 509	13 14	0 108	1 384	1 509	13 14	0 092	1 179	1 292	12 84
4291 630	0 108	1 384	1 509	13 14	0 108	1 379	1 504	13 10	0 093	1 189	1 302	12 94
4294 936	0 112	1 433	1 558	13 57	0 106	1 354	1 479	12 88	0 093	1 189	1 302	12 94
—	$\phi = 51°9$				$\phi = 51°9$				$\phi = 59°4$			
4196 699	0 072	0 955	1 056	12 15	0 073	0 967	1 068	12 28	0 060	0 793	0 879	12 26
4197 257	0 073	0 966	1 067	12 27	0 075	0 995	1 096	12 65	0 057	0 757	0 843	11 76
4203 730	0 073	0 964	1 065	12 25	0 075	0 994	1 095	12 64	0 058	0 766	0 852	11 88
4209 144	0 074	0 977	1 078	12 40	0 074	0 978	1 079	12 41	0 064	0 849	0 935	13 04
4216 136	0 074	0 976	1 077	12 39	0 074	0 977	1 078	12 40	0 060	0 790	0 876	12 22
4220 509	0 075	0 985	1 086	12 49	0 075	0 983	1 084	12 47	0 061	0 800	0 886	12 36
4232 887	0 078	1 014	1 115	12 82	0 073	0 955	1 056	12 15	0 062	0 808	0 894	12 47
4257 815	0 076	0 984	1 085	12 48	0 076	0 985	1 086	12 49	0 064	0 828	0 914	12 75
4258 477	0 080	1 035	1 136	13 07	0 076	0 985	1 086	12 49	0 065	0 846	0 932	13 00
4265 418	0 076	0 982	1 083	12 46	0 074	0 959	1 060	12 19	0 065	0 845	0 931	12 98
4266 081	0 079	1 020	1 121	12 89	0 078	1 009	1 110	12 87	0 067	0 865	0 951	13 24
4268 915	0 074	0 957	1 058	12 17	0 075	0 969	1 070	12 32	0 062	0 798	0 884	12 33
4276 836	0 079	1 017	1 118	12 86	0 074	0 953	1 054	12 13	0 062	0 797	0 883	12 32
4284 838	0 077	0 991	1 092	12 56	0 076	0 976	1 077	12 39	0 061	0 785	0 871	12 15
4287 566	0 078	1 001	1 102	12 68	0 079	1 010	1 111	12 88	0 065	0 833	0 919	12 82
4288 310	0 077	0 986	1 087	12 50	0 081	1 034	1 135	13 05	0 064	0 819	0 905	12 62
4290 377	0 078	1 000	1 101	12 67	0 080	1 023	1 124	12 93	0 064	0 819	0 905	12 62
4290 542	0 080	1 024	1 125	12 94	0 077	0 986	1 087	12 50	0 064	0 819	0 905	12 62
4291 630	0 079	1 010	1 111	12 87	0 079	1 009	1 110	12 87	0 063	0 805	0 891	12 43
4294 936	0 075	0 959	1 060	12 19	0 078	0 998	1 099	12 65	0 062	0 794	0 880	12 27

TABLE 4 —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907—Continued

Plate ω 50. 1907, Feb. 3, 5^h 40^m G M T Measured by L on T Distance from Limb 3 5 mm Quality, good

		$\psi - P$	π	ϕ	η	sec η
	°	°	°	°	°	
☉	313 8	10 5	12 2	77 8	30 9	1 166
☉−Ω	239 4	19 5	20 5	69 5	18 1	1 052
P	13 0	35 5	36 0	54 0	10 6	1 017
D	−6 3	51 5	51 8	38 2	7 9	1 009
Diameter	174 1 mm	66 5	66 7	23 3	6 8	1 008
Factor	1 042	82 5	82 5	7 5	6 3	1 006

λ	$\phi = 7°5$				$\phi = 23°3$				$\phi = 38°2$			
	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 141	1 861	2 002	14 32	0 128	1 700	1 834	14 18	0 104	1 383	1 500	13 55
4197 257	0 141	1 861	2 002	14 32	0 129	1 713	1 847	14 28	0 105	1 395	1 512	13 66
4203 730	0 143	1 888	2 029	14 52	0 130	1 721	1 855	14 34	0 106	1 400	1 517	13 70
4209 144	0 144	1 896	2 037	14 57	0 130	1 719	1 853	14 32	0 106	1 399	1 516	13 70
4216 136	0 142	1 867	2 008	14 37	0 129	1 699	1 834	14 18	0 104	1 374	1 491	13 47
4220 509	0 144	1 892	2 033	14 54	0 130	1 712	1 846	14 27	0 106	1 397	1 514	13 68
4232 887	0 143	1 872	2 013	14 40	0 130	1 705	1 839	14 22	0 106	1 391	1 508	13 62
4257 815	0 145	1 897	2 038	14 58	0 132	1 714	1 848	14 28	0 108	1 404	1 521	13 74
4258 477	0 143	1 854	1 995	14 27	0 130	1 688	1 822	14 08	0 108	1 403	1 520	13 73
4265 418	0 146	1 887	2 028	14 51	0 131	1 697	1 831	14 15	0 108	1 399	1 516	13 70
4266 081	0 146	1 880	2 021	14 46	0 134	1 734	1 868	14 44	0 108	1 399	1 516	13 70
4268 915	0 146	1 879	2 020	14 45	0 130	1 682	1 816	14 04	0 109	1 402	1 519	13 72
4276 836	0 145	1 863	2 004	14 34	0 131	1 689	1 823	14 09	0 108	1 390	1.507	13 61
4284 838	0 145	1 861	2 002	14 32	0 131	1 683	1 817	14 04	0 110	1 415	1 532	13 84
4287 566	0 144	1 855	1 996	14 28	0 134	1.721	1 855	14 34	0 108	1 388	1 505	13 60
4288 310	0 144	1 847	1 988	14 22	0 133	1 708	1 842	14 24	0 110	1 413	1 530	13 82
4290 377	0 144	1 847	1 988	14 22	0.131	1 681	1 815	14 03	0 107	1 378	1 495	13.51
4290 542	0 146	1 870	2 011	14 39	0 132	1 694	1 828	14 13	0 111	1 424	1 541	13 92
4291 630	0 144	1 849	1 990	14 24	0 130	1 667	1 801	13 92	0 109	1 397	1.514	13.68
4294 936	0 147	1 880	2 021	14 46	0 131	1 679	1 813	14 01	0.108	1 385	1 502	13 57

λ	$\phi = 54°0$				$\phi = 69°5$				$\phi = 77°8$				$\phi = 77°8$*			
	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 068	0 911	1 001	12 09	0 038	0 527	0 583	11 82	0 015	0 232	0 266	8 94	0 016	0.253	0 287	9 64
4197 257	0 068	0 911	1 001	12 09	0 039	0 541	0 597	12 10	0 016	0 245	0 279	9 37	0 017	0 259	0 293	9 84
4203 730	0 069	0 923	1 013	12 24	0 040	0 552	0 608	12 33	0 019	0 292	0 326	10 95	0 021	0 329	0 363	12 20
4209 144	0 071	0 946	1 036	12 51	0 040	0 551	0 607	12 31	0 018	0 276	0 310	10 41	0 020	0 306	0 340	11 42
4216 136	0 067	0 892	0 982	11 86	0 038	0 525	0 581	11 78	0 017	0 260	0 294	9 88	0 017	0 260	0 294	9 88
4220 509	0 069	0 918	1 008	12 18	0 040	0 549	0 605	12 26	0 017	0 259	0 293	9 84	0 021	0 317	0 351	11 79
4232 887	0 070	0 926	1 016	12 27	0 039	0 533	0 589	11 94	0 019	0 288	0 322	10 82	0 017	0 264	0 298	10 01
4257 815	0 072	0 943	1 033	12 48	0 042	0 570	0 626	12 69	0 021	0 313	0 347	11 66	0 019	0 283	0 317	10 65
4258 477	0 069	0 906	0 996	12 02	0 041	0 555	0 611	12 39	0 018	0 271	0 305	10 25	0 023	0 343	0 377	12 67
4265 418	0 071	0 928	1 018	12 30	0 041	0 554	0 610	12 37	0 018	0 270	0 304	10 21	0 019	0 282	0 316	10 62
4266 081	0 073	0 952	1 042	12 59	0 043	0 577	0 633	12 83	0 021	0 313	0 347	11 66	0 022	0 325	0 359	12 06
4268 915	0 070	0 912	1 002	12 11	0 039	0 527	0 583	11 82	0 018	0 270	0 304	10 21	0 021	0 322	0 356	11 96
4276 836	0 070	0 912	1 002	12 11	0 040	0 538	0 595	12 06	0 020	0 299	0 333	11 19	0 022	0 324	0 358	12 03
4284 838	0 073	0 948	1 038	12 54	0 041	0 551	0 607	12 30	0 019	0 283	0 317	10.64	0 020	0 301	0 335	11 25
4287 566	0 072	0 936	1 026	12 39	0 042	0 565	0 619	12 55	0 018	0 269	0 303	10 18	0 019	0 285	0 319	10 72
4288 310	0 072	0 935	1 025	12 38	0 040	0 537	0 593	12 02	0 019	0 282	0 316	10 62	0 019	0 280	0 314	10 55
4290 377	0 073	0 944	1 034	12 49	0 040	0 537	0 593	12 02	0 019	0 282	0 316	10 62	0 020	0 298	0 332	11 15
4290 542	0 072	0 932	1 022	12 35	0 041	0 548	0 605	12 26	0 018	0 268	0 302	10 15	0 023	0.345	0 379	12 73
4291 630	0 068	0 880	0 970	11 71	0 041	0 548	0 605	12 26	0 020	0 297	0 331	11 12	0 022	0 333	0 367	12 33
4294 936	0.072	0 931	1 021	12 33	0 044	0 589	0 640	12 97	0 018	0 268	0 302	10 15	0 018	0 269	0 303	10 18

*Measured by A. on G.

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 56 1907, Feb 15, 6^h 5^m G M T Measured by L on T. Distance from Limb 3 4 mm Quality, good

	°	$p-P$ °	π °	ϕ °	η °	sec η
☉	325 9	19 4	20 5	69 5	19 9	1 064
☉−☊	251 5	35 4	36 0	54 0	11 7	1 021
P	17 5	51 4	51 7	38 3	8 8	1 012
D	−6 9	67 4	67 6	22 4	7 4	1 008
Diameter	174 0 mm	82 4	82 5	7 5	6 9	1 007
Factor	1 041					

λ	$\phi = 7°5$				$\phi = 22°4$				$\phi = 38°3$			
	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 141	1 871	2 012	14 41	0 127	1 691	1 825	14 01	0 098	1 307	1 422	12 86
4197 257	0 142	1 883	2 024	14 49	0 128	1 701	1 835	14 08	0 098	1 307	1 422	12 86
4203 730	0 143	1 892	2 033	14 56	0 131	1 734	1 868	14 33	0 102	1 350	1 465	13 25
4209 144	0 143	1 889	2 030	14 54	0 131	1 732	1 866	14 32	0 101	1 337	1 452	13 14
4216 136	0 142	1 872	2 013	14 41	0 128	1 790	1 824	14 00	0 100	1 324	1 439	13 02
4220 509	0 143	1 881	2 022	14 48	0 132	1 732	1 866	14 32	0 103	1 359	1 474	13 34
4232 887	0 143	1 858	1 999	14 31	0 132	1 730	1 864	14 30	0 102	1 341	1 456	13 17
4257 815	0 147	1 907	2 048	14 67	0 135	1 749	1 883	14 45	0 106	1 374	1 489	13 47
4258 477	0 145	1 881	2 022	14 48	0 132	1 709	1 843	14 14	0 102	1 329	1 444	13 07
4265 418	0 144	1 862	2 003	14 34	0 133	1 721	1 855	14 23	0 103	1 335	1 450	13 12
4266 081	0 146	1 888	2 029	14 53	0 135	1 746	1 880	14 43	0 106	1 372	1 487	13 45
4268 915	0 147	1 898	2 039	14 60	0 132	1 703	1 837	14 10	0 104	1 346	1 461	13 22
4276 836	0 145	1 868	2 009	14 39	0 134	1 727	1 861	14 28	0 104	1 345	1 460	13 21
4284 838	0 146	1 874	2 015	14 43	0 133	1 709	1 843	14 14	0 103	1 329	1 444	13 07
4287 566	0 146	1 873	2 014	14 42	0 133	1 708	1 842	14 13	0 104	1 340	1 455	13 16
4288 310	0 144	1 848	1 989	14 24	0 133	1 707	1 841	14 13	0 104	1 339	1 454	13 16
4290 377	0 145	1 858	1 999	14 31	0 133	1 706	1 840	14 12	0 104	1 338	1 453	13 15
4290 542	0 145	1 858	1 999	14 31	0 134	1 717	1 851	14 20	0 105	1 349	1 464	13 25
4291 630	0 144	1 844	1 985	14 21	0 133	1 704	1 838	14 10	0 103	1 325	1 440	13 03
4294 936	0 146	1 868	2 009	14 39	0 134	1 716	1 850	14 20	0 104	1 336	1 451	13 13

λ	$\phi = 54°0$				$\phi = 69°5$			
4196 699	0 067	0 910	1 000	12 08	0 038	0 533	0 586	11 88
4197 257	0 069	0 932	1 022	12 34	0 038	0 533	0 586	11 88
4203 730	0 072	0 969	1 059	12 79	0 042	0 587	0 640	12 97
4209 144	0 072	0 966	1 056	12 75	0 042	0 586	0 639	12 95
4216 136	0 068	0 909	0 999	12 07	0 038	0 530	0 583	11 82
4220 509	0 071	0 951	1 041	12 57	0 042	0 582	0 635	12 87
4232 887	0 072	0 959	1 049	12 67	0 041	0 547	0 600	12 16
4257 815	0 074	0 971	1 061	12 82	0 043	0 588	0 641	12 99
4258 477	0 072	0 947	1 037	12 53	0 041	0 544	0 597	12 10
4265 418	0 072	0 945	1 035	12 50	0 042	0 573	0 626	12 69
4266 081	0 074	0 969	1 059	12 79	0 044	0 600	0 653	13 24
4268 915	0 072	0 944	1 034	12 49	0 040	0 542	0 595	12 06
4276 836	0 073	0 956	1 046	12 63	0 042	0 568	0 621	12 59
4284 838	0 072	0 943	1 033	12 48	0 041	0 555	0 608	12 33
4287 566	0 074	0 964	1 054	12 73	0 041	0 554	0 607	12 31
4288 310	0 073	0 953	1 043	12 60	0 041	0 554	0 607	12 31
4290 377	0 071	0 919	1 009	12 19	0 041	0 554	0 607	12 31
4290 542	0 073	0 952	1 042	12 58	0 041	0 553	0 606	12 28
4291 630	0 074	0 963	1 053	12 72	0 043	0 580	0 633	12 83
4294 936	0 076	0 986	1 076	13 00	0 041	0 533	0 586	11 88

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 60 1907, Feb 28, 7^h 15^m G M T Measured by L on T Distance from Limb 3 0 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
☉	339 1	38 9	39 5	50 5	11 4	1 020
☉ − ☊	264 7	45 9	46 3	43 7	10 0	1 015
P	21 4	54 7	55 0	35 0	8 8	1 012
D	−7 2	61 7	61 9	28 1	8 2	1 010
Diameter	173 2 mm	69 4	69 6	20 4	7 7	1 009
Factor	1 036	83 4	83 5	6 5	7 4	1 008

λ	$\phi = 6°5$				$\phi = 6°5$				$\phi = 20°4$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 144	1 904	2 044	14 60	0 143	1 892	2 032	14 52	0 128	1 697	1 830	13 86
4197 257	0 144	1 904	2 044	14 60	0 144	1 804	2 044	14 60	0 130	1 717	1 850	14 01
4203 730	0 146	1 927	2 067	14 78	0 146	1 928	2 068	14 78	0 130	1 716	1 849	14 00
4209 144	0 147	1 936	2 076	14 83	0 145	1 909	2 049	14 64	0 131	1 725	1 858	14 07
4216 136	0 146	1 918	2 058	14 71	0 146	1 931	2 071	14 79	0 129	1 697	1 830	13 86
4220 509	0 146	1 915	2 055	14 68	0 146	1 929	2 069	14 78	0 131	1 719	1 852	14 03
4232 887	0 147	1 919	2 059	14 71	0 148	1 932	2 072	14 80	0 132	1 724	1 857	14 06
4257 815	0 150	1 940	2 080	14 86	0 151	1 951	2 091	14 94	0 133	1 721	1 854	14 04
4258 477	0 148	1 908	2 048	14 63	0 147	1 901	2 041	14 58	0 132	1 708	1 841	13 94
4265 418	0 147	1 895	2 035	14 54	0 148	1 908	2 048	14 63	0 131	1 691	1 824	13 82
4266 081	0 147	1 895	2 035	14 54	0 150	1 933	2 073	14 81	0 135	1 744	1 877	14 22
4268 915	0 148	1 905	2 045	14 61	0 149	1 912	2 052	14 66	0 133	1 714	1 847	13 99
4276 836	0 146	1 873	2 013	14 38	0 149	1 912	2 052	14 66	0 132	1 696	1 829	13 85
4284 838	0 149	1 907	2 047	14 63	0 146	1 868	2 008	14 35	0 134	1 717	1 850	14 01
4287 566	0 149	1 906	2 046	14 62	0 149	1 906	2 046	14 62	0 131	1 678	1 811	13 71
4288 310	0 149	1 905	2 045	14 61	0 147	1 869	2 009	14 35	0 132	1 690	1 823	13 80
4290 377	0 147	1 877	2 017	14 41	0 146	1 865	2 005	14 32	0 134	1 703	1 836	13 90
4290 542	0 147	1 877	2 017	14 41	0 149	1 903	2 043	14 59	0 132	1 689	1 822	13 80
4291 630	0 146	1 864	2 004	14 32	0 148	1 887	2 027	14 48	0 133	1 700	1 833	13 88
4294 936	0 148	1 887	2 027	14 48	0 148	1 887	2 027	14 48	0 134	1 710	1 843	13 96

λ	$\phi = 28°1$				$\phi = 35°0$				$\phi = 43°7$				$\phi = 50°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 114	1 510	1 636	13 17	0 104	1 380	1 497	12 97	0 086	1 144	1 247	12 24	0 073	0 977	1 068	11 92
4197 257	0 114	1 510	1 636	13 17	0 104	1 380	1 497	12 97	0 087	1 158	1 261	12 38	0 074	0 989	1 080	12 05
4203 730	0 118	1 562	1 678	13 50	0 106	1 401	1 518	13 16	0 088	1 168	1 271	12 48	0 075	1 002	1 093	12 20
4209 144	0 118	1 557	1 683	13 55	0 106	1 400	1 517	13 15	0 089	1 182	1 285	12 62	0 075	1 000	1 091	12 18
4216 136	0 114	1 501	1 627	13 09	0 105	1 384	1 501	13 01	0 087	1 152	1 255	12 32	0 074	0 985	1 076	12 01
4220 509	0 120	1 572	1 698	13 67	0 107	1 406	1.523	13 20	0 089	1 174	1 277	12 54	0 077	1 021	1 112	12 41
4232 887	0 120	1 570	1 696	13 65	0 107	1 401	1 518	13 16	0 090	1 182	1 285	12 62	0 076	1 004	1 095	12 22
4257 815	0 122	1 580	1 706	13 73	0 109	1 413	1 530	13 26	0 093	1 210	1 313	12 89	0 078	1 020	1 111	12 40
4258 477	0 121	1 563	1 689	13 59	0 108	1 397	1 514	13 12	0 092	1 193	1 297	12 74	0 077	1 008	1 099	12 27
4265 418	0 120	1 550	1 676	13 49	0 108	1 396	1 513	13 11	0 092	1 192	1 295	12 72	0 076	0 993	1 084	12 10
4266 081	0 123	1 582	1 708	13 75	0 109	1 409	1 526	13 23	0 094	1 220	1 323	12 99	0 079	1 029	1 120	12 50
4268 915	0 120	1 548	1 674	13 47	0 108	1 395	1 512	13 10	0 092	1 189	1 292	12 69	0 077	1 004	1 095	12 22
4276 836	0 122	1 568	1 694	13 63	0 110	1 415	1 532	13 28	0 091	1 176	1 279	12 56	0 076	0 989	1 080	12 05
4284 838	0 121	1 552	1 678	13 50	0 108	1 387	1 504	13 04	0 093	1 197	1 300	12 77	0 078	1 011	1 102	12 30
4287 566	0 122	1 566	1 694	13 63	0 108	1 387	1 504	13 04	0 092	1 186	1 289	12 66	0 076	0 985	1 076	12 01
4288 310	0 121	1 552	1 678	13 50	0 109	1 398	1 515	13 13	0 092	1 185	1 288	12 65	0 078	1 009	1 100	12 28
4290 377	0 122	1 564	1 690	13 60	0 108	1 385	1 502	13 02	0 092	1 184	1 287	12 64	0 075	0 972	1 063	11 86
4290 542	0 121	1 550	1 676	13 49	0 109	1 397	1 514	13 12	0 092	1.182	1 285	12 62	0 077	0 996	1 087	12 13
4291 630	0 122	1 560	1 686	13 57	0 108	1 384	1 501	13 01	0 093	1 193	1 296	12 73	0 078	1 008	1 099	12 27
4294 936	0 122	1 559	1 685	13 56	0 108	1 383	1 500	13 00	0 092	1 181	1 284	12 61	0 078	1 007	1 098	12 26

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 61 1907, Feb 28, 7^h 40^m G M T Measured by L on T Distance from Limb 3 1 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	339 1	23 7	24 7	65 3	17 5	1 049
O−Ω	264 7	29 7	30 5	59 5	14 3	1 032
P	21 4	38 9	39 5	50 5	11 4	1 020
D	−7 2	45 9	46 3	43 7	10 0	1 016
Diameter	173 2 mm					
Factor	1 037					

λ	$\phi = 43°7$				$\phi = 50°5$				$\phi = 59°5$				$\phi = 59°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699																
4197 257																
4203 730	0 086	1 144	1 247	12 25	0 076	1 015	1 106	12 34	0 054	0 730	0 801	11 20	0 056	0 757	0 828	11 58
4209 144	0 088	1 148	1 251	12 28	0 077	1 026	1 117	12 47	0 058	0 781	0 852	11 92	0 055	0 742	0 813	11 37
4216 136	0 085	1 127	1 230	12 08	0 073	0 971	1 062	11 85	0 054	0 728	0 799	11 18	0 053	0 713	0 784	10 97
4220 509	0 086	1 139	1 242	12 20	0 076	1 009	1 100	12 28	0 058	0 779	0 850	11 89	0 055	0 739	0 810	11 33
4232 887	0 088	1 158	1 261	12 38	0 076	1 004	1 095	12 22	0 056	0 752	0 823	11 51	0 056	0 749	0 820	11 47
4257 815	0 090	1 174	1 277	12 54	0 079	1 034	1 125	12 56	0 060	0 803	0 874	12 22	0 060	0 794	0 865	12 10
4258 477	0 089	1 157	1 260	12 37	0 079	1 033	1 124	12 55	0 057	0 754	0 825	11 54	0 058	0 765	0 836	11 69
4265 418					0 077	1 005	1 096	12 23	0 058	0 768	0 839	11 74	0 060	0 791	0 862	12 06
4266 081	0 092	1 196	1 309	12 85	0 079	1 030	1 121	12 51	0 060	0 792	0 863	12 07				
4268 915					0 078	1 015	1 106	12 34	0 059	0 778	0 849	11 88	0 060	0 791	0 862	12 06
4276 836	0 096	1 163	1 266	12 43	0 078	1 013	1 104	12 32	0 057	0 749	0 820	11 47	0 058	0 761	0 832	11 64
4284 838	0 096	1 161	1 264	12 41	0 079	1 024	1 115	12 44	0 058	0 760	0 831	11 62	0 058	0 760	0 831	11 62
4287 566	0 092	1 186	1 289	12 66	0 079	1 023	1 114	12 43	0 057	0 746	0 817	11 43	0 058	0 760	0 831	11 62
4288 310	0 091	1 175	1 278	12 55	0 079	1 022	1 113	12 42	0 060	0 785	0 856	11 97	0 059	0 773	0 844	11 80
4290 377	0 091	1 173	1 276	12 53	0 077	0 995	1 086	12 12	0 059	0 772	0 843	11 79	0 059	0 773	0 844	11 80
4290 542	0 090	1 159	1 262	12 39	0 080	1 034	1 125	12 56	0 058	0 760	0 831	11 62	0 060	0 784	0 855	11 96
4291 630	0 091	1 172	1 275	12 52	0 078	1 008	1 099	12 27	0 058	0 758	0 829	11 60	0 060	0 784	0 855	11 96
4294 936	0 090	1 157	1 260	12 37	0 077	0 994	1 085	12 11	0 059	0 771	0 842	11 78	0 058	0 758	0 829	11 60
	$\phi = 65°3$				$\phi = 65°3$				$\phi = 65°3$ *				$\phi = 65°3$ *			
4196 699																
4197 257																
4203 730	0 044	0 605	0 664	11 28	0 045	0 618	0 677	11 50	0 046	0 633	0 692	11 75	0 047	0 652	0 711	12 08
4209 144	0 045	0 617	0 676	11 49	0 045	0 617	0 676	11 49	0 047	0 676	0 735	12 49	0 047	0 640	0 699	11 88
4216 136	0 043	0 587	0 646	10 98	0 043	0 587	0 646	10 98	0 048	0 652	0 711	12 08	0 045	0 621	0 680	11 55
4220 509	0 044	0 602	0 661	11 23	0 044	0 600	0 659	11 19	0 047	0 645	0 704	11 96	0 047	0 642	0 701	11 91
4232 887	0 045	0 611	0 670	11 38	0 047	0 638	0 697	11 84	0 050	0 669	0 728	12 37	0 049	0 669	0 728	12 37
4257 815	0 048	0 646	0 705	11 98	0 048	0 646	0 705	11 98	0 049	0 659	0 718	12 20	0 045	0 636	0 695	11 81
4258 477	0 046	0 619	0 678	11 52	0 047	0 631	0 690	11 72	0 051	0 684	0 743	12 62	0 050	0 673	0 732	12 44
4265 418	0 046	0 618	0 677	11 50	0 045	0 604	0 663	11 26	0 047	0 629	0 688	11 69	0 051	0 685	0 744	12 64
4266 081	0 048	0 644	0 703	11 94	0 048	0 643	0 702	11 93	0 051	0 687	0 746	12 67	0 048	0 645	0 704	11 96
4268 915	0 048	0 643	0 702	11 93					0 052	0 698	0 757	12 86	0 054	0 719	0 778	13 22
4276 836	0 045	0 602	0 661	11 23	0 046	0 615	0 674	11 45	0 051	0 680	0 739	12 56	0 050	0 672	0 731	12 42
4284 838	0 046	0 614	0 673	11 43	0 047	0 626	0 685	11 64	0 052	0 694	0 753	12 79	0 053	0 712	0 771	13 10
4287 566	0 047	0 625	0 684	11 62	0 047	0 625	0 684	11 62	0 049	0 656	0 715	12 15	0 052	0 687	0 746	12 67
4288 310	0 047	0 625	0 684	11 62	0 047	0 626	0 685	11 64	0 049	0 653	0 712	12 10	0 049	0 656	0 715	12 15
4290 377	0 048	0 638	0 697	11 84	0 047	0 625	0 684	11 62	0 048	0 645	0 704	11 96	0 051	0 682	0 741	12 59
4290 542	0 045	0 598	0 657	11 16	0 046	0 612	0 671	11 40	0 049	0 650	0 709	12 05	0 049	0 650	0 709	12 05
4291 630	0 047	0 624	0 683	11 60	0 046	0 611	0 670	11 38	0 052	0 697	0 756	12 84	0 049	0 650	0 709	12 05
4294 936	0 048	0 637	0 696	11 82	0 046	0 610	0 669	11 37	0 050	0 668	0 727	12 35	0 048	0 639	0 698	11 86

* Measured by A on G

TABLE 4 —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 62 1907, Feb 28, $9^h\ 15^m$ G M T Measured by L on T Distance from Limb 3 1 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
☉	339 1	51 5	51 9	38 1	9 2	1 013
☉−☊	264 7	59 5	59 8	30 2	8 4	1 011
P	21 4	67 3	67 5	22 5	7 8	1 009
D	−7 2	74 3	74 4	15 6	7 5	1 009
Diameter	173 2 mm	82 0	82 1	7 9	7 3	1 008
Factor	1 037	96 0	96 0	−6 0	7 3	1 008

λ	$\phi = -6°0$				$\phi = 7°9$				$\phi = 15°6$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 144	1 905	2 045	14 60	0 138	1 831	1 971	14 13	0 138	1 829	1 965	14 48
4197 257	0 144	1 905	2 045	14 60	0 139	1 842	1 982	14 21	0 139	1 840	1 976	14 57
4203 730	0 145	1 914	2 054	14 66	0 142	1 880	2 020	14 48	0 142	1 875	2 011	14.82
4209 144	0 146	1 923	2 063	14 72	0 142	1 877	2 017	14 46	0 142	1 872	2 008	14 80
4216 136	0 144	1 891	2 031	14 50	0 141	1 854	1 994	14 29	0 141	1 854	1 990	14 67
4220 509	0 147	1 926	2 066	14 74	0 142	1 864	2 004	14 36	0 142	1 864	2 000	14 74
4232 887	0 148	1 931	2 071	14 78	0 144	1 879	2 019	14 47	0 144	1 880	2 016	14 86
4257 815	0 150	1 938	2 078	14 83	0 147	1 897	2 037	14 60	0 147	1 900	2 036	15 01
4258 477	0 146	1 887	2 027	14 47	0 146	1 874	2 014	14 44	0 144	1 872	2 008	14 80
4265 418	0 147	1 895	2 035	14 52	0 144	1 869	2 009	14 40	0 144	1 867	2 003	14 76
4266 081	0 150	1 933	2 073	14 80	0 144	1 868	2 008	14 39	0 144	1 866	2 002	14 76
4268 915	0 147	1 889	2 029	14 48	0 144	1 867	2 007	14 38	0 144	1 865	2 001	14 75
4276 836	0 147	1 887	2 027	14 47	0 145	1 864	2 004	14 36	0 145	1 862	1 998	14 73
4284 838	0 148	1 894	2 034	14 52	0 144	1 830	1 970	14 12	0 144	1 845	1 981	14 60
4287 566	0 146	1 868	2 008	14 33	0 143	1 825	1 965	14 08	0 143	1 830	1 966	14 47
4288 310	0 150	1 917	2 057	14 68	0 144	1 844	1 984	14 22	0 144	1 842	1 978	14 58
4290 377	0 148	1 890	2 030	14 49	0 143	1 830	1 970	14 12	0 142	1 828	1.964	14.48
4290 542	0 148	1 890	2 030	14 49	0 144	1 842	1 982	14.21	0 144	1 840	1 976	14 57
4291 630	0 146	1 865	2 005	14 31	0 145	1 853	1 993	14 28	0 145	1 851	1 987	14 65
4294 936	0 148	1 887	2 027	14 47	0 145	1 859	1 999	14 33	0 145	1 857	1 993	14 69
	$\phi = 22°5$				$\phi = 30°2$				$\phi = 38°1$			
4196 699	0 124	1 644	1 775	13 64	0 115	1 517	1 641	13 48	0 105	1 396	1 509	13 61
4197 257	0 123	1 628	1 759	13 52	0 116	1 529	1 653	13 58	0 105	1 396	1 509	13 61
4203 730	0 126	1 664	1 795	13 79	0 118	1 548	1 672	13 73	0 107	1 415	1 528	13 79
4209 144	0 127	1 673	1 804	13 86	0 118	1 547	1 671	13 73	0 107	1 413	1 526	13 77
4216 136	0 125	1 645	1 776	13 65	0 116	1 527	1 651	13 55	0 106	1 399	1 512	13 64
4220 509	0 126	1 655	1 786	13 72	0 118	1 544	1 668	13 70	0 107	1 409	1 522	13 73
4232 887	0 128	1 672	1 803	13 85	0 118	1 543	1 667	13 69	0 106	1 391	1 504	13 57
4257 815	0 131	1 694	1 825	14 02	0 120	1 554	1 678	13 78	0 110	1 428	1 541	13 90
4258 477	0 130	1 681	1 812	13 92	0 119	1 541	1 665	13 68	0 108	1 402	1 515	13 67
4265 418	0 128	1 650	1 781	13 69	0 118	1 521	1 645	13 51	0 108	1 400	1 513	13 65
4266 081	0 130	1 676	1 807	13 89	0 120	1 549	1 673	13 74	0 110	1 424	1 537	13 87
4268 915	0 130	1 675	1 806	13 88	0 118	1 518	1 642	13 49	0 108	1 389	1 502	13.55
4276 836	0 129	1 656	1 787	13 73	0 118	1 518	1 642	13 49	0 108	1 389	1 502	13 55
4284 838	0 131	1 678	1 809	13 90	0 116	1 490	1 614	13 26	0 107	1 378	1 491	13 45
4287 566	0 130	1 662	1 793	13 78	0 117	1 501	1 625	13 35	0 108	1 388	1 501	13 54
4288 310	0 129	1 649	1 780	13 68	0 122	1 560	1 684	13 83	0 108	1.388	1 501	13 54
4290 377	0 130	1 660	1 791	13 76	0 118	1 511	1 635	13.43	0 107	1 375	1 488	13 42
4290 542	0 127	1 623	1 754	13 48	0 120	1 535	1 659	13 63	0 108	1 387	1 500	13 53
4291 630	0 128	1 634	1 765	13 56	0 120	1 534	1 658	13 62	0 109	1.397	1 510	13.62
4294 936	0 128	1 633	1 764	13 56	0 120	1 533	1 657	13 61	0 110	1.409	1 522	13 73

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 63 1907, Feb 28, $9^h\ 45^m$ G M T Measured by L on T Distance from Limb 3 1 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	339 1	45 8	46 2	43 8	10 0	1 016
O−Ω	264 7	38 8	39 3	50 7	11 5	1 021
P	21 4	54 6	54 9	35 1	8 8	1 012
D	−7 2	61 6	61 8	28 2	8 2	1 010
Diameter	173 2 mm	69 3	69 4	20 6	7 7	1 009
Factor	1 037	82 8	82 8	7 2	7 3	1 008

λ	$\phi = 7°2$				$\phi = 20°6$				$\phi = 28°2$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 143	1 905	2 045	14 63	0 126	1 668	1 801	13 66	0 114	1 510	1 636	13 18
4197 257	0 144	1 918	2 058	14 73	0 128	1 694	1 827	13 86	0 116	1 536	1 662	13 39
4203 730	0 147	1 953	2 093	14 98	0 120	1 600	1 733	13 14	0 118	1 560	1 686	13 58
4209 144	0 142	1 885	2 025	14 49	0 129	1 700	1 833	13 90	0 119	1 570	1 696	13 66
4216 136	0 144	1 905	2 045	14 63	0 130	1 708	1 841	13 96	0 118	1 553	1 679	13 53
4220 509	0 144	1 902	2 042	14 61	0 132	1 730	1 863	14 13	0 120	1 575	1 701	13 70
4232 887	0 146	1 920	2 060	14 74	0 133	1 736	1 869	14 18	0 120	1 569	1 695	13 65
4257 815	0 150	1 953	2 093	14 98	0 133	1 719	1 852	14 05	0 120	1 555	1 681	13 54
4258 477	0 148	1 927	2 067	14 79	0 133	1 719	1 852	14 05	0 118	1 526	1 652	13 31
4265 418	0 147	1 896	2 036	14 57	0 132	1 702	1 835	13 92	0 118	1 524	1 650	13 29
4266 081	0 150	1 947	2 087	14 93	0 133	1 715	1 848	14 02	0 124	1 602	1 728	13 92
4268 915	0 146	1 894	2 034	14 55	0 134	1 725	1 858	14 09	0 120	1 545	1 671	13 46
4276 836	0 147	1 901	2 041	14 61	0 133	1 708	1 841	13 96	0 120	1 542	1 668	13 44
4284 838	0 149	1 921	2 061	14 75	0 134	1 716	1 849	14 02	0 123	1 579	1 705	13 73
4287 566	0 148	1 906	2 046	14 64	0 136	1 738	1 871	14 19	0 121	1 549	1 675	13 49
4288 310	0 146	1 881	2 021	14 46	0 134	1 713	1 846	14 00	0 124	1 588	1 714	13 81
4290 377	0 147	1 892	2 032	14 54	0 134	1 712	1 845	13 99	0 118	1 510	1 636	13 18
4290 542	0 148	1 903	2 043	14 62	0 135	1 724	1 857	14 08	0 120	1 535	1 661	13 38
4291 630	0 148	1 902	2 042	14 61	0 134	1 711	1 844	13 99	0 119	1 522	1 648	13 28
4294 936	0 148	1 901	2 041	14 61	0 132	1 685	1 818	13 79	0 118	1 508	1 634	13 16
	$\phi = 35°1$				$\phi = 50°7$				$\phi = 43°8$			
4196 699	0 105	1 396	1 513	13 13	0 068	0 912	1 002	11 23	0 086	1 150	1 254	12 33
4197 257	0 106	1 409	1 526	13 25	0 069	0 924	1 014	11 36	0 088	1 174	1 278	12 57
4203 730	0 108	1 431	1 548	13 44	0 072	0 962	1 052	11 79	0 090	1 199	1 303	12 82
4209 144	0 108	1 428	1 545	13 40	0 071	0 948	1 038	11 63	0 089	1 181	1 285	12 64
4216 136	0 106	1 399	1 516	13 16	0 071	0 945	1 035	11 60	0 087	1 152	1 256	12 35
4220 509	0 110	1 447	1 564	13 57	0 073	0 971	1 061	11 89	0 090	1 188	1 292	12 71
4232 887	0 108	1 412	1 529	13 27	0 071	0 939	1 029	11 53	0 090	1 183	1 287	12 66
4257 815	0 111	1 440	1 557	13 51	0 076	0 995	1 085	12 16	0 094	1 224	1 328	13 06
4258 477	0 108	1 399	1 516	13 16	0 075	0 982	1 072	12 02	0 090	1 172	1 276	12 55
4265 418	0 107	1 385	1 502	13 03	0 075	0 982	1 072	12 02	0 089	1 157	1 261	12 40
4266 081	0 112	1 449	1 566	13 59	0 075	0 984	1 074	12 04	0 092	1 194	1 298	12 77
4268 915	0 110	1 422	1 539	13 36	0 076	0 989	1 079	12 09	0 091	1 180	1 284	12 63
4276 836	0 108	1 394	1 511	13 11	0 076	0 988	1 078	12 08	0 090	1 165	1 269	12 48
4284 838	0 110	1 415	1 532	13 29	0 078	1 012	1 102	12 35	0 092	1 186	1 290	12 69
4287 566	0 110	1 413	1 530	13 28	0 074	0 959	1 049	11 76	0 092	1 185	1 289	12 68
4288 310	0 112	1 437	1 554	13 48	0 074	0 958	1 048	11 75	0 090	1 160	1 264	12 43
4290 377	0 108	1 387	1 504	13 05	0 076	0 983	1 073	12 03	0 091	1 171	1 275	12 54
4290 542	0 111	1 424	1 541	13 37	0 074	9 957	1 047	11 74	0 093	1 196	1 300	12 79
4291 630	0 112	1 435	1 552	13 47	0 076	0 982	1 072	12 02	0 092	1 182	1 286	12 65
4294 936	0 112	1 434	1 551	13 46	0 077	0 995	1 085	12 16	0 092	1 182	1 286	12 65

TABLE 4 —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 —Continued

Plate ω 55 1907, Feb 15, $5^h 40^m$ G M T Measured by L on T Distance from Limb 3 4 mm Quality, good.

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
☉	325 9	51 4	51 7	38 3	8 8	1 012
☉–☊	251 5	67 4	67 6	22 4	7 4	1 008
P	17 5	82 4	82 5	7 5	6 9	1 007

D −6 9
Diameter 174 0 mm
Factor 1 041

λ	$\phi = 7°5$				$\phi = 22°4$				$\phi = 38°3$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 142	1 884	2 025	14 50	0 129	1 711	1 845	14 16	0 098	1 304	1 419	12 84
4197 257	0 142	1 884	2 025	14 50	0 129	1 711	1 845	14 16	0 097	1 292	1 407	12 73
4203 730	0 146	1 924	2 065	14 79	0 130	1 721	1 855	14 23	0 102	1 354	1 469	13 29
4209 144	0 147	1 936	2 077	14 87	0 131	1 730	1 864	14 30	0 103	1 364	1 479	13 38
4216 136	0 145	1 910	2 051	14 69	0 129	1 699	1 833	14 07	0 099	1 314	1 429	12 93
4220 509	0 146	1 918	2 059	14 74	0 131	1 723	1 857	14 25	0 103	1 361	1 476	13 35
4232 887	0 147	1 924	2 065	14 79	0 132	1 728	1 862	14 28	0 104	1 368	1 483	13 42
4257 815	0 149	1 923	2 064	14 78	0 135	1 741	1 875	14 39	0 106	1 378	1 493	13 51
4258 477	0 146	1 898	2 039	14 60	0 131	1 696	1 830	14 04	0 105	1 365	1 480	13 39
4265 418	0 148	1 919	2 060	14 75	0 131	1 695	1 829	14 03	0 104	1 352	1 467	13 27
4266 081	0 151	1 953	2 094	14 99	0 135	1 738	1 872	14 37	0 108	1 395	1 510	13 66
4268 915	0 149	1 918	2 059	14 74	0 134	1 725	1 859	14 27	0 104	1 347	1 462	13 23
4276 836	0 148	1 903	2 044	14 64	0 132	1 700	1 834	14 07	0 103	1 334	1 449	13 11
4284 838	0 149	1 913	2 054	14 71	0 134	1 722	1 856	14 24	0 104	1 342	1 457	13 18
4287 566	0 147	1 885	2 026	14 51	0 133	1 709	1 843	14 14	0 104	1 341	1 456	13 17
4288 310	0 149	1 910	2 051	14 69	0 133	1 708	1 842	14 13	0 106	1 365	1 480	13 39
4290 377	0 146	1 871	2 012	14 41	0 133	1 707	1 841	14 13	0 105	1 352	1 467	13 27
4290 542	0 148	1 896	2 037	14 59	0 134	1 715	1 849	14 19	0 102	1 315	1 430	12 94
4291 630	0 148	1 895	2 036	14 58	0 134	1 714	1 848	14 18	0 105	1 350	1 465	13 25
4294 936	0 148	1 894	2 035	14 57	0 131	1 678	1 812	13 90	0 108	1 387	1 502	13 59

Plates ω 64, ω 67, ω 68, and ω 69 1907, April 7, ω 64, $3^h 20^m$, ω 67, $5^h 45^m$, ω 68, $6^h 45^m$, ω 69, $7^h 10^m$ G M T Measured by L on T Distance from Limb 2 3 mm Quality, good

	ω 64, 67	ω 68, 69	$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	°	
☉	16 7	16 8	10 9	12 5	77 5	29 5	1 149
☉–☊	302 3	302 4					
P		26 5 °					
D		−6 1					

Diameter 171 7 mm
Factor 1 027

λ	ω 64, $\phi = 77°5$				ω 67, $\phi = 77°5$				ω 68, $\phi = 77°5$				ω 69, $\phi = 77°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 020	0 298	0 333	10 92	0 018	0 269	0 304	9 97	0 018	0 269	0 304	9 97	0 020	0 298	0 333	10 92
4197 257	0 022	0 304	0 339	11 12	0 020	0 298	0 333	10 92	0 020	0 298	0 333	10 92	0 020	0 298	0 333	10 92
4203 730	0 023	0 342	0 377	12 37	0 022	0 327	0 362	11 87	0 022	0 328	0 363	11 91	0 022	0 328	0 363	11 91
4209 144	0 022	0 303	0 338	11 09	0 022	0 327	0 362	11 87	0 022	0 328	0 363	11 91	0 021	0 312	0 347	11 38
4216 136	0 020	0 295	0 330	10 82	0 019	0 282	0 317	10 40	0 019	0 282	0 317	10 40	0 020	0 296	0 331	10 86
4220 509	0 022	0 324	0 359	11 78	0 022	0 325	0 360	11 81	0 022	0 326	0 361	11 84	0 024	0 355	0 390	12 79
4232 887	0 022	0 324	0 359	11 78	0 022	0 324	0 359	11 78	0 022	0 323	0 358	11 74	0 024	0 351	0 386	12 66
4257 815	0 024	0 349	0 384	12 60	0 026	0 380	0 415	13 61	0 026	0 380	0 415	13 61	0 028	0 408	0 443	14 53
4258 477	0 024	0.349	0 384	12 60	0 022	0 323	0 358	11 74	0 024	0 349	0 384	12 60	0 024	0 349	0 384	12 60
4265 418	0 024	0 349	0 384	12 60	0 023	0 335	0 370	12 14	0 022	0 322	0 357	11 71	0 022	0 320	0 355	11 64
4266 081	0 025	0 363	0 398	13 06	0 026	0 379	0 414	13 58	0 025	0 363	0 398	13 06	0 024	0 349	0 384	12 60
4268 915	0 023	0 334	0 369	12 10	0 024	0 347	0 382	12 53	0 023	0 334	0 369	12 10	0 022	0 320	0 355	11 64
4276 836	0 022	0 319	0 354	11 61	0 024	0 347	0 382	12 53	0 024	0 348	0 383	12 56	0 024	0 348	0 383	12 56
4284 838	0 022	0 319	0 354	11 61	0 024	0 347	0 382	12 53	0 024	0 348	0 383	12 56	0 022	0 320	0 355	11 64
4287 566	0 021	0 303	0 338	11 09	0 025	0 361	0 396	12 99	0 022	0 317	0 352	11 55	0 024	0 347	0 382	12 53
4288 310	0 022	0 318	0 353	11 58	0 024	0 347	0 382	12 53	0 023	0 332	0 367	12 04	0 024	0 347	0.382	12 53
4290 377	0 025	0 361	0 396	12 99	0 022	0 317	0 352	11 55	0 024	0 347	0 382	12 53	0 022	0 319	0 354	11 61
4290 542	0 023	0 332	0 367	12 04	0 023	0 332	0 367	12 04	0 026	0 374	0 409	13 42	0 024	0 346	0 381	12 50
4291 630	0 025	0 360	0 395	12 96	0 028	0 404	0 439	14 40	0 025	0 360	0 395	12 96	0 024	0 346	0 381	12 50
4294 936	0 022	0 317	0 352	11 55	0 024	0 346	0 381	12 50	0 024	0 346	0 381	12 50	0 023	0 332	0 367	12 04

TABLE 4 —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 81 1907, April 22, 8^h 20^m G M T $\phi = 79°5$, measured by A on T $\phi = 67°2$ and $72°5$ measured by L on T Distance from Limb 1 1 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	31 5	9 3	10 5	79 5	28 1	1 134
O−Ω	317 1	16 8	17 5	72 5	16 6	1 044
P	25 7	22 3	22 8	67 2	12 8	1 026
D	−4 9					
Diameter	169 3 mm					
Factor	1 013					

λ	$\phi = 67°2$				$\phi = 67°2$				$\phi = 72°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 042	0 553	0 617	11 30	0 041	0 541	0 605	11 08	0 032	0 429	0 480	11 33
4197 257	0 042	0 553	0 617	11 30	0 042	0 553	0 617	11 30	0 033	0 441	0 492	11 62
4203 730	0 043	0 564	0 628	11 51	0 044	0 577	0 641	11 74	0 034	0 454	0 505	11 92
4209 144	0 045	0 588	0 652	11 95	0 045	0 588	0 652	11 95	0 034	0 453	0 504	11 90
4216 136	0 044	0 575	0 639	11 71	0 040	0 523	0 587	10 75	0 033	0 439	0 490	11 57
4220 509	0 044	0 572	0 636	11 65	0 044	0 574	0 638	11 69	0 034	0 451	0 502	11 85
4232 887	0 046	0 596	0 660	12 09	0 048	0 617	0 681	12 48	0 035	0 459	0 510	12 04
4257 815	0 049	0 628	0 692	12 68	0 048	0 615	0 679	12 44	0 036	0 470	0 521	12 30
4258 477	0 048	0 615	0 679	12 44	0 045	0 577	0 641	11 74	0 034	0 444	0 495	11 69
4265 418	0 046	0 590	0 654	11 98	0 046	0 590	0 654	11 98	0 034	0 444	0 495	11 69
4266 081	0 050	0 638	0 702	12 86	0 048	0 613	0 677	12 40	0 037	0 482	0 533	12 58
4268 915	0 047	0 600	0 664	12 16	0 046	0 587	0 651	11 93	0 033	0 430	0 481	11 36
4276 836	0 048	0 613	0 677	12 40	0 045	0 575	0 639	11 71	0 036	0 465	0 516	12 18
4284 838	0 044	0 559	0 623	11 41	0 047	0 598	0 662	12 13	0 034	0 440	0 591	11 59
4287 566	0 048	0 610	0 674	12 35	0 048	0 611	0 675	12 37	0 036	0 465	0 516	12 18
4288 310	0 048	0 610	0 674	12 35	0 046	0 584	0 648	11 87	0 034	0 440	0 491	11 59
4290 377	0 047	0 598	0 662	12 13	0 045	0 573	0 637	11 67	0 035	0 452	0 503	11 88
4290 542	0 045	0 572	0 636	11 65	0 047	0 597	0 661	12 11	0 034	0 439	0 490	11 57
4291 630	0 047	0 597	0 661	12 11	0 047	0 597	0 661	12 11	0 034	0 439	0 490	11 57
4294 936	0 048	0 609	0 673	12 33	0 048	0 609	0 673	12 33	0 036	0 464	0 515	12 16
	$\phi = 72°5$				$\phi = 79°5$				$\phi = 79°5$			
4196 699	0 032	0 428	0 479	11 31	0 019	0 277	0 311	12 12	0 019	0 281	0 315	12 27
4197 257	0 031	0 416	0 467	11 03	0 019	0 278	0 312	12 15	0 019	0 278	0 312	12 15
4203 730	0 034	0 454	0 505	11 92	0 020	0 282	0 316	12 31	0 020	0 293	0 327	12 74
4209 144	0 034	0 453	0 504	11 90	0 019	0 279	0 313	12 19	0 019	0 281	0 315	12 27
4216 136	0 032	0 425	0 476	11 24	0 019	0 280	0 314	12 23	0 020	0 281	0 315	12 27
4220 509	0 034	0 452	0 503	11 88	0 020	0 293	0 327	12 74	0 020	0 282	0 316	12 31
4232 887	0 033	0 436	0 487	11 50	0 020	0 282	0 316	12 31	0 019	0 276	0 310	12 08
4257 815	0 036	0 470	0 521	12 30	0 021	0 293	0 327	12 74	0 021	0 294	0 328	12 78
4258 477	0 034	0 443	0 494	11 66	0 021	0 293	0 327	12 74	0 020	0 286	0 320	12 47
4265 418	0 034	0 443	0 494	11 66	0 020	0 279	0 313	12 19	0 020	0 276	0 310	12 08
4266 081	0 036	0 470	0 521	12 30	0 020	0 284	0 318	12 39	0 020	0 284	0 318	12 39
4268 915	0 034	0 442	0 493	11 64	0 020	0 280	0 314	12 23	0 020	0 282	0 316	12 31
4276 836	0 034	0 441	0 492	11 62	0 020	0 282	0 316	12 31	0 020	0 278	0 312	12 15
4284 838	0 033	0 427	0 478	11 29	0 019	0 272	0 306	11 92	0 020	0 278	0 312	12 15
4287 566	0 034	0 440	0 491	11 59	0 020	0 277	0 311	12 12	0 020	0 285	0 319	12 43
4288 310	0 035	0 453	0 504	11 90	0 019	0 272	0 306	11 92	0 020	0 279	0 313	12 19
4290 377	0 035	0 452	0 503	11 88	0 019	0 272	0 306	11 92	0 019	0 272	0 306	11 92
4290 542	0 036	0 464	0 515	12 16	0 020	0 280	0 314	12 23	0 019	0 266	0 300	11 69
4291 630	0 035	0 453	0 504	11 90	0 020	0 282	0 316	12 31	0 020	0 274	0 308	12 00
4294 936	0 036	0 464	0 515	12 16	0 020	0 282	0 316	12 31	0 020	0 277	0 311	12 12

TABLE 4.—RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907—Continued

Plate ω 83 1907, May 10, $10^h\ 15^m$ G M T Measured by A on G Distance from Limb 1 1 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
☉	49 1	10 4	10 8	79 2	16 7	1 044
☉−☊	−25 3	15 4	15 6	74 4	11 6	1 021
P	22 4	26 4	26 5	63 5	6 9	1 007
D	−3 0					
Diameter	168 2 mm					
Factor	1 013					

λ	ϕ = 63°5				ϕ = 63°5				ϕ = 74°4			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 048	0 624	0 697	11 09	0 049	0 636	0 709	11 28	0 030	0 393	0 443	11 70
4197 257	0 050	0 651	0 724	11 52	0 048	0 623	0 696	11 07	0 030	0 388	0 438	11 56
4203 730	0 049	0 630	0 703	11 19	0 051	0 658	0 731	11 63	0 029	0 382	0 432	11 40
4209 144	0 049	0 628	0 701	11 15	0 052	0 665	0 738	11 74	0 030	0 386	0 436	11 51
4216 136	0 050	0 637	0 710	11 30	0 048	0 622	0 695	11 06	0 030	0 390	0 440	11 62
4220 509	0 049	0 631	0 704	11 21	0 052	0 667	0 740	11 77	0 029	0 380	0 430	11 35
4232 887	0 048	0 618	0 691	10 99	0 051	0 656	0 729	11 60	0 030	0 393	0 443	11 69
4257 815	0 050	0 636	0 709	11 28	0 053	0 669	0 742	11 81	0 030	0 384	0 434	11 46
4258 477	0 050	0 634	0 707	11 25	0 052	0 655	0 728	11 58	0 030	0 379	0 429	11 32
4265 418	0 050	0 629	0 702	11 17	0 050	0 634	0 707	11 25	0 031	0 390	0 440	11 62
4266 081	0 050	0 627	0 700	11 14	0 050	0 627	0 700	11 14	0 032	0 409	0 459	12 12
4268 915	0 051	0 641	0 714	11 36	0 051	0 646	0 719	11 44	0 029	0 370	0 420	11 09
4276 836	0 049	0 612	0 685	10 90	0 054	0 677	0 750	11 93	0 029	0 371	0 421	11 12
4284 838	0 049	0 610	0 683	10 87	0 051	0 635	0 708	11 26	0 030	0 380	0 430	11 35
4287 566	0 049	0 617	0 690	10 98	0 050	0 629	0 702	11 17	0 031	0 394	0 444	11 72
4288 310	0 050	0 629	0 702	11 17	0 051	0 639	0 712	11 33	0 031	0 394	0 444	11 72
4290 377	0 050	0 623	0 696	11 07	0 052	0 650	0.723	11 50	0 028	0 354	0 434	11 46
4290 542	0 050	0 623	0 696	11 07	0 052	0 648	0 721	11 47	0 031	0 387	0 437	11 54
4291 630	0 050	0 623	0 696	11 07	0 052	0 653	0 726	11 55	0 030	0 384	0 434	11 46
4294 936	0.049	0 613	0 686	10 92	0 052	0 647	0 720	11 46	0 030	0 383	0 433	11 43

λ	ϕ = 74°4				ϕ = 79°2				ϕ = 79°2			
4196 699	0 031	0 404	0 454	11 99	0 019	0 252	0 293	11 10	0 019	0 255	0 296	11 21
4197 257	0 032	0 424	0 474	12 51	0 019	0 257	0 298	11 29	0 018	0 247	0 288	10 91
4203 730	0 032	0 418	0 468	12 36	0 020	0 268	0 309	11 71	0 020	0 273	0 314	11 90
4209 144	0 032	0 418	0 468	12 36	0 020	0 267	0 308	11 67	0 020	0 270	0 311	11 78
4216 136	0 031	0 401	0 451	11 91	0 020	0 272	0 313	11 86	0 019	0 248	0 289	10 95
4220 509	0 033	0 429	0 479	12 65	0 020	0 260	0 301	11 40	0 020	0 271	0 312	11 82
4232 887	0 032	0 409	0 459	12 12	0 020	0 270	0 311	11 78	0 020	0 261	0.302	11.44
4257 815	0 034	0 435	0 485	12 80	0 020	0 261	0 302	11 44	0 020	0 256	0 297	11 25
4258 477	0 034	0 430	0 480	12 67	0 019	0 251	0 292	11 06	0 019	0 246	0 287	10 87
4265 418	0 034	0 432	0 482	12 72	0 020	0 267	0 308	11 67	0 020	0 256	0.297	11 25
4266 081	0 032	0 432	0 482	12 72	0 021	0 274	0 315	11 93	0 020	0 261	0 302	11 44
4268 915	0 032	0 411	0 461	12 17	0 020	0 266	0 307	11 63	0 019	0 246	0 287	10 87
4276 836	0 032	0 404	0 454	11 98	0 020	0 262	0 303	11 48	0 020	0 264	0 305	11 56
4284 838	0 033	0 413	0 463	12 22	0 020	0 259	0 300	11 37	0 020	0 256	0 297	11 25
4287 566	0 032	0 405	0 455	12 01	0 021	0 269	0 310	11 75	0 020	0 254	0 295	11 18
4288 310	0 031	0 389	0 439	11 59	0 020	0 261	0 302	11 44	0 020	0 261	0 302	11 44
4290 377	0 032	0 395	0 445	11 75	0 018	0 233	0 274	10 38	0 020	0 258	0 299	11 33
4290 542	0 033	0 412	0 462	12 20	0 019	0 248	0 289	10 95	0 020	0 258	0 299	11 33
4291 630	0 034	0 432	0 482	12 72	0 021	0 269	0 310	11 75	0 020	0 258	0 299	11 33
4294 936	0 032	0 399	0 449	11 85	0 020	0 253	0 294	11 14	0 021	0 273	0 314	11 90

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 85 1907, May 30, 12^h 5^m G M T Measured by A on T Distance from Limb 1 0 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	68 4	10 2	10 2	79 8	4 2	1 003
O−Ω	−6 0	15 2	15 2	74 8	2 8	1 001
P	16 3	26 2	26 2	63 8	1 7	1 000
D	−0 7					
Diameter	167 9 mm					
Factor	1 012					

λ	$\phi = 63°8$				$\phi = 63°8$				$\phi = 74°8$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 054	0 692	0 760	12 22	0 055	0 704	0 772	12 41	0 032	0 410	0 461	12 48
4197 257	0 054	0 692	0 760	12 22	0 055	0 704	0 772	12 41	0 032	0 410	0 461	12 48
4203 730	0 055	0 703	0 771	12 40	0 058	0 741	0 809	13 01	0 034	0 434	0 485	13 13
4209 144	0 058	0 740	0 808	12 99	0 056	0 714	0 782	12 57	0 034	0 433	0 484	13 11
4216 136	0 056	0 712	0 780	12 54	0 055	0 699	0 767	12 33	0 034	0 432	0 483	13 08
4220 509	0 056	0 711	0 779	12 52	0 058	0 737	0 805	12 95	0 034	0 432	0 483	13 08
4232 887	0 058	0 734	0 802	12 90	0 058	0 734	0 802	12 90	0 033	0 419	0 470	12 73
4257 815	0 058	0 727	0 795	12 78	0 058	0 727	0 795	12 78	0 033	0 413	0 464	12 56
4258 477	0 056	0 702	0 770	12 38	0 057	0 713	0 781	12 56	0 034	0 426	0 477	12 92
4265 418	0 058	0 725	0 793	12 75	0 060	0 749	0 817	13 14	0 035	0 438	0 489	13 24
4266 081	0 058	0 724	0 792	12 74	0 058	0 724	0 792	12 73	0 036	0 450	0 501	13 57
4268 915	0 057	0 710	0 778	12 51	0 059	0 736	0 804	12 93	0 033	0 412	0 463	12 54
4276 836	0 059	0 734	0 802	12 90	0 060	0 736	0 804	12 93	0 033	0 410	0 461	12 48
4284 838	0 059	0 732	0 800	12 86	0 060	0 744	0 812	13 06	0 035	0 434	0 485	13 13
4287 566	0 057	0 706	0 774	12 45	0 059	0 731	0 799	12 85	0 035	0 433	0 484	13 10
4288 310	0 057	0 706	0 774	12 45	0 060	0 743	0 811	13 04	0 032	0 396	0 447	12 10
4290 377	0 056	0 693	0 761	12 24	0 058	0 718	0 786	12 64	0 034	0 421	0 472	12 78
4290 542	0 057	0 705	0 773	12 43	0 058	0 718	0 786	12 64	0 033	0 408	0 459	12 43
4291 630	0 058	0 717	0 785	12 62	0 058	0 704	0 772	12 41	0 034	0 420	0 471	12 75
4294 936	0 058	0 717	0 785	12 62	0 058	0 717	0 785	12 62	0 034	0 420	0 471	12 75

λ	$\phi = 74°8$				$\phi = 79°8$				$\phi = 79°8$			
4196 699	0 032	0 410	0 461	12 48	0 019	0 247	0 287	11 51	0 018	0 236	0 276	11 06
4197 257	0 029	0 372	0 423	11 45	0 019	0 242	0 282	11 31	0 018	0 231	0 271	10 86
4203 730	0 031	0 397	0 448	12 13	0 020	0 257	0 297	11 91	0 019	0 247	0 287	11 51
4209 144	0 031	0 396	0 447	12 10	0 020	0 256	0 296	11 87	0 020	0 256	0 296	11 87
4216 136	0 030	0 382	0 433	11 72	0 019	0 238	0 278	11 15	0 018	0 234	0 274	10 98
4220 509	0 034	0 432	0 483	13 08	0 020	0 255	0 295	11 83	0 021	0 265	0 305	12 23
4232 887	0 032	0 405	0 456	12 34	0 020	0 249	0 289	11 59	0 021	0 264	0 304	12 19
4257 815	0 034	0 426	0 487	13 19	0 021	0 259	0 299	11 99	0 020	0 251	0 291	11 67
4258 477	0 031	0 389	0 440	11 91	0 020	0 254	0 294	11 79	0 021	0 266	0 306	12 27
4265 418	0 032	0 400	0 451	12 21	0 020	0 246	0 286	11 47	0 019	0 243	0 283	11 35
4266 081	0 034	0 424	0 475	12 87	0 020	0 271	0 311	12 47	0 020	0 246	0 286	11 47
4268 915	0 032	0 399	0 450	12 19	0 021	0 265	0 305	12 23	0 020	0 255	0 295	11 83
4276 836	0 035	0 435	0 486	13 16	0 020	0 254	0 294	11 79	0 019	0 240	0 280	11 23
4284 838	0 032	0 397	0 448	12 13	0 020	0 249	0 289	11 59	0 020	0 244	0 284	11 39
4287 566	0 034	0 421	0 472	12 78	0 020	0 248	0 288	11 55	0 020	0 244	0 284	11 39
4288 310	0 036	0 445	0 496	13 43	0 020	0 248	0 288	11 55	0 020	0 246	0 286	11 47
4290 377	0 035	0 433	0 484	13 10	0 020	0 243	0 283	11 35	0 020	0 248	0 288	11 55
4290 542	0 036	0 445	0 495	13 40	0 020	0 253	0 293	11 75	0 020	0 251	0 291	11 67
4291 630	0 035	0 433	0 484	13 10	0 019	0 241	0 281	11 27	0 020	0 248	0 288	11 55
4294 936	0 034	0 420	0 471	12 75	0 020	0 243	0 283	11 35	0 021	0 262	0 302	12 11

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 85 — Continued 1907, May 30, 12^h 5^m G M T Measured by L on T Distance from Limb 1 0 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	68 4	15 2	15 2	74 8	2 8	1 001
O−Ω	−6 0	26 2	26 2	63 8	1 7	1 000
P	16 3					

D −0 7
Diameter 167 9 mm
Factor 1 012

λ	$\phi = 63°8$				$\phi = 63°8$				$\phi = 74°8$				$\phi = 74°8$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 049	0 627	0 695	11 18	0 048	0 613	0 681	10 95	0 030	0 385	0 436	11 81	0 029	0 371	0 422	11 43
4197 257	0 049	0 640	0 708	11 38	0 048	0 613	0 681	10 95	0 031	0 397	0 448	12 13	0 029	0 371	0 422	11 43
4203 730	0 050	0 637	0 704	11 34	0 052	0 664	0 732	11 77	0 032	0 406	0 457	12 37	0 030	0 384	0.435	11 78
4209 144	0 052	0 662	0 730	11 74	0 052	0 661	0 729	11 72	0 032	0 405	0 456	12 35	0 031	0 395	0.446	12 08
4216 136	0 051	0 647	0 715	11 50	0 050	0 634	0 702	11 27	0 030	0 382	0 433	11 72	0 030	0 382	0 433	11 72
4220 509	0 053	0 672	0 740	11 90	0 052	0 659	0 727	11 69	0 033	0 417	0 468	12 67	0 032	0 405	0 456	12 35
4232 887	0 053	0 669	0 737	11 85	0 053	0 661	0 737	11 85	0 033	0 417	0 468	12 67	0 032	0 405	0 456	12 35
4257 815	0 055	0 685	0 753	12 11	0 055	0 689	0 757	12 17	0 036	0 449	0 500	13 54	0 034	0 425	0 476	12.89
4258 477	0 053	0 659	0 727	11 69	0 053	0 661	0 729	11 72	0 034	0 423	0 474	12 83	0 033	0 387	0 438	11 86
4265 418	0 054	0 670	0 738	11 87	0 051	0 636	0 704	11 32	0 032	0 399	0 450	12 18	0 033	0 387	0.438	11 86
4266 081	0 055	0 683	0 751	12 08	0 054	0 672	0 740	11 90	0 035	0 435	0 486	13 16	0 036	0 448	0 499	13.51
4268 915	0 054	0 670	0 738	11 87	0 054	0 670	0 738	11 87	0 032	0 398	0 449	12 16	0 034	0 423	0 474	12 83
4276 836	0 054	0 670	0 738	11 87	0 051	0 633	0 701	11 27	0 033	0 410	0 461	12 48	0 031	0 386	0 437	11 83
4284 838	0 053	0 656	0 724	11 64	0 053	0 655	0 723	11 63	0 033	0 409	0 460	12 45	0 034	0 421	0 472	12.78
4287 566	0 053	0 655	0 723	11 63	0 054	0 667	0 735	11 82	0 032	0 396	0.447	12 10	0 033	0 409	0 460	12.46
4288 310	0 053	0 655	0 723	11 63	0 053	0 655	0 723	11 63	0 033	0 408	0 459	12 43	0 034	0 421	0.472	12 78
4290 377	0 056	0 692	0 760	12 22	0 052	0 643	0 711	11 43	0 034	0 420	0 471	12 75	0 032	0 396	0 447	12 10
4290 542	0 055	0 680	0 748	12 03	0 054	0 667	0 735	11 82	0 033	0 408	0 459	12 43	0 034	0 420	0 471	12.75
4291 630	0 054	0 667	0 735	11 82	0 054	0 667	0 735	11 82	0 036	0 444	0 495	13 40	0 034	0 420	0 471	12 75
4294 936	0 052	0 642	0 710	11 42	0 053	0 654	0 722	11 61	0 034	0 420	0 471	12 75	0 033	0 408	0 459	12.43

Plate ω 91 1907, June 23, 5^h 55^m G M T Measured by L on T Distance from Limb 1 2 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	91 1	37 0	37 0	53 0	3 4	1 002
O−Ω	16 7	52 7	52 7	37 3	2 6	1 001
P	6 4	68 2	68 2	21 8	2 2	1 001
D	2 1	83 2	83 2	6 8	2 1	1 001

Diameter 168 1 mm
Factor 1 014

λ	$\phi = 6°8$				$\phi = 21°8$				$\phi = 37°3$				$\phi = 53°0$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 148	1 901	2 035	14 55	0 130	1 669	1 798	13 76	0 102	1 312	1 429	12 75	0 076	0 978	1 071	12 63
4197 257	0 148	1 900	2 034	14 55	0 130	1 669	1 798	13 76	0 102	1 311	1 428	12 74	0 076	0 977	1 070	12 62
4203 730	0 150	1 919	2 053	14 68	0 132	1 691	1 820	13 93	0 104	1 331	1 448	12 92	0 077	0 987	1 080	12 74
4209 144	0 150	1 917	2 051	14 67	0 132	1 688	1 817	13 91	0 104	1 328	1 445	12 89	0 078	1 000	1 093	12 89
4216 136	0 149	1 900	2 034	14 55	0 130	1 658	1 787	13 67	0 104	1 325	1 442	12 87	0 078	0 997	1 090	12 86
4220 509	0 150	1 906	2 040	14 59	0 132	1 678	1 807	13 83	0 104	1 325	1 442	12 87	0 078	0 995	1 088	12 83
4232 887	0 150	1 901	2 035	14 55	0 132	1 673	1 802	13 79	0 105	1 332	1 449	12 93	0 078	0 990	1 083	12 78
4257 815	0 152	1 909	2 043	14 61	0 135	1 691	1 820	13 93	0 107	1 344	1 461	13 04	0 080	1 005	1 098	12 95
4258 477	0 152	1 907	2 041	14 60	0 133	1 667	1 796	13 74	0 106	1 330	1 447	12 91	0 078	0 980	1 073	12 66
4265 418	0 152	1 905	2 039	14 58	0 133	1 665	1 794	13 73	0 107	1 340	1 457	13 00	0 079	0 991	1 084	12 79
4266 081	0 153	1 914	2 048	14 65	0 134	1 677	1 806	13 82	0 108	1 352	1 469	13 11	0 080	1 002	1 095	12.92
4268 915	0 152	1 892	2 026	14 49	0 134	1 671	1 800	13 77	0 107	1 324	1 441	12 86	0 080	1 000	1 093	12.89
4276 836	0 152	1 891	2 025	14 48	0 134	1 668	1 797	13 75	0 107	1 322	1 439	12 84	0 081	1 010	1 103	12.89
4284 838	0 152	1 889	2 023	14 46	0 134	1 666	1 795	13 74	0 107	1 331	1 448	12 92	0 080	0 997	1 090	12 86
4287 566	0 153	1 902	2 036	14 56	0 135	1 677	1 806	13 82	0 109	1 354	1 471	13 13	0 079	0 985	1 078	12 72
4288 310	0 153	1 899	2 033	14 54	0 135	1 676	1 805	13 81	0 107	1 328	1 445	12 89	0 081	1 007	1 100	12 98
4290 377	0 152	1 885	2 019	14 44	0 134	1 675	1 804	13 80	0 106	1 310	1 427	12 73	0 080	0 995	1 088	12 83
4290 542	0 153	1 895	2 029	14 51	0 136	1 686	1 815	13 89	0 107	1 329	1.446	12 90	0 080	0 993	1 086	12 81
4291 630	0 152	1 883	2 017	14 42	0 135	1 673	1 802	13 79	0 108	1 340	1 457	13 00	0 082	1 018	1 111	13 11
4294 936	0 153	1 894	2 028	14 50	0 136	1 684	1 813	13 87	0 108	1 338	1 455	12 98	0 082	1 010	1 103	13 01

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 86 1907, May 31, $4^{h}\ 55^{m}$ G M T Measured by A on G Distance from Limb 1 3 mm Quality, Good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	69 1	8 9	8 9	81 1	4 4	1 003
O−Ω	−5 3	13 9	13 9	76 1	2 8	1 001
P	16 0	25 9	25 9	64 1	1 6	1 000
D	−0 6	45 2	45 2	44 8	0 9	1 000
Diameter	168 5 mm	60 2	60 2	29 8	0 8	1 000
Factor	1 016	75 2	75 2	14 8	0 7	1 000

λ	$\phi = 14°8$				$\phi = 29°8$				$\phi = 44°8$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v-v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 143	1 837	1 971	14 47	0 116	1 493	1 617	13 23	0 095	1 225	1 331	13 31
4197 257	0 142	1 826	1 960	14 39	0 120	1 544	1 668	13 65	0 092	1 183	1 289	12 89
4203 730	0 142	1 827	1 961	14 40	0 119	1 525	1 649	13 48	0 094	1 208	1 314	13 14
4209 144	0 146	1 874	2 008	14 74	0 124	1 582	1 706	13 96	0 098	1 249	1 355	13 55
4216 136	0 142	1 809	1 943	14 27	0 116	1 481	1 605	13 13	0 096	1 226	1 332	13 32
4220 509	0 146	1 861	1 995	14 64	0 121	1 546	1 670	13 66	0 100	1 269	1 375	13 75
4232 887	0 147	1 863	1 997	14 66	0 123	1 564	1 688	13 81	0 091	1 160	1 266	12 66
4257 815	0 143	1 793	1 927	14 15	0 121	1 527	1 651	13 50	0 096	1 207	1 313	13 13
4258 477	0 149	1 873	2 007	14 74	0 125	1 569	1 693	13 85	0 100	1 262	1 368	13 68
4265 418	0 148	1 855	1 989	14 61	0 121	1 515	1 639	13 40	0 094	1 176	1 282	12 82
4266 081	0 142	1 779	1 913	14 05	0 127	1 590	1 714	14 03	0 092	1 154	1 260	12 60
4268 915	0 146	1 824	1 958	14 38	0 123	1 538	1 662	13 60	0 092	1 162	1 268	12 68
4276 836	0 147	1 833	1 967	14 45	0 127	1 584	1 708	13 98	0 095	1 188	1 294	12 94
4284 838	0 147	1 828	1 962	14 41	0 128	1 594	1 718	14 06	0 095	1 187	1 293	12 93
4287 566	0 144	1 796	1 930	14 17	0 123	1 531	1 655	13 54				
4288 310	0 142	1 766	1 904	13 96	0 124	1 537	1 661	13 59	0 094	1 169	1 275	12 75
4290 377	0 147	1 824	1 958	14 38	0 125	1 551	1 675	13 70	0 096	1 192	1 298	12 98
4290 542	0 149	1 849	1 983	14 56	0 123	1 531	1 655	13 54	0 096	1 197	1 303	13 03
4291 630	0 150	1 867	2 001	14 69	0 125	1 557	1 681	13 75	0 094	1 175	1 281	12 81
4294 936	0 149	1 850	1 984	14 57	0 123	1 529	1 653	13 52	0 095	1 180	1 286	12 86
	$\phi = 64°1$				$\phi = 76°1$				$\phi = 81°1$			
4196 699	0 052	0 664	0 738	12 00	0 025	0 322	0 370	10 93	0 018	0 232	0 269	12 34
4197 257	0 053	0 682	0 756	12 27	0 024	0 309	0 357	10 55	0 019	0 242	0 279	12 80
4203 730	0 057	0 729	0 803	13 05	0 028	0 355	0 403	11 91	0 018	0 231	0 268	12 30
4209 144	0 055	0 701	0 775	12 60	0 028	0 354	0 402	11 88	0 019	0 244	0 281	12 89
4216 136	0 054	0 685	0 759	12 32	0 025	0 322	0 370	10 93	0 017	0 218	0 255	11 70
4220 509	0 055	0 702	0 776	12 61	0 029	0 368	0 416	12 29	0 019	0 245	0 282	12 94
4232 887	0 056	0 711	0 785	12 76	0 028	0 356	0 404	11 94	0 018	0 224	0 261	11 98
4257 815	0 058	0 698	0 772	12 55	0 030	0 378	0 426	12 59	0 019	0 241	0 278	12 76
4258 477	0 056	0 703	0 777	12 63	0 031	0 388	0 436	12 88	0 019	0 236	0 273	12 53
4265 418	0 056	0 699	0 773	12 57	0 031	0 392	0 440	13 00	0 018	0 228	0 265	12 16
4266 081	0 057	0 718	0 792	12 87	0 030	0 377	0 425	12 56	0 019	0 238	0 275	12 62
4268 915	0 054	0 671	0 745	12 10	0 028	0 356	0 404	11 94	0 018	0 223	0 260	11 93
4276 836	0 057	0 715	0 789	12 84	0 031	0 390	0 438	12 94	0 018	0 220	0 257	11 79
4284 838	0 055	0 680	0 754	12 24	0 028	0 345	0 393	11 61	0 017	0 212	0 249	11 43
4287 566	0 057	0 712	0 786	12 78	0 031	0 388	0 436	12 88	0 018	0 224	0 261	11 98
4288 310	0 056	0 698	0 772	12 55	0 028	0 349	0 397	11 73	0 019	0 234	0 271	12 44
4290 377	0 053	0 656	0 730	11 87	0 030	0 363	0 411	12 14	0 018	0 226	0 263	12 07
4290 542	0 056	0 691	0 765	12 42	0 028	0 373	0 421	12 44	0 019	0 234	0 271	12 44
4291 630	0 059	0 730	0 804	13 07	0 030	0 368	0 416	12 29	0 019	0 238	0 275	12 62
4294 936	0 055	0 680	0 754	12 24	0 028	0 348	0 396	11 70	0 018	0 223	0 260	11 93

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 87 1907, June 22, 11h 10m G M T Measured by L on T Distance from Limb 0 6 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
☉	90 4	30 9	30 9	59 1	3 9	1 002
☉−Ω	16 0	37 9	37 9	52 1	3 2	1 002
P	6 8	51 4	51 4	38 6	2 6	1 001
D	2 0	66 9	66 9	23 1	2 2	1 001
Diameter	167 0 mm	81 9	81 9	8 1	2 0	1 001
Factor	1 007					

λ	$\phi = 8°1$				$\phi = 23°1$				$\phi = 38°6$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 148	1 887	2 021	14 49	0 129	1 646	1 774	13 69	0 099	1 265	1 379	12 53
4197 257	0 147	1 875	2 009	14 41	0 130	1 658	1 786	13 77	0 100	1 277	1 391	12 64
4203 730	0 149	1 896	2 030	14 56	0 132	1 679	1 807	13 95	0 103	1 311	1 425	12 94
4209 144	0 150	1 901	2 035	14 59	0 133	1 689	1 817	14 02	0 103	1 305	1 419	12 89
4216 136	0 148	1 875	2 009	14 41	0 130	1 647	1 775	13 70	0 101	1 280	1 394	12 66
4220 509	0 150	1 897	2 031	14 56	0 134	1 694	1 822	14 06	0 104	1 314	1 428	12 97
4232 887	0 150	1 889	2 023	14 51	0 133	1 675	1 803	13 92	0 103	1 297	1 411	12 82
4257 815	0 153	1 905	2 039	14 62	0 136	1 696	1 824	14 08	0 106	1 320	1 434	13 03
4258 477	0 152	1 890	2 024	14 51	0 134	1 667	1 795	13 85	0 104	1 297	1 411	12 82
4265 418	0 152	1 890	2 024	14 51	0 134	1 666	1 794	13 85	0 106	1 312	1 426	12 95
4266 081	0 154	1 915	2 049	14 69	0 135	1 677	1 805	13 93	0 107	1 324	1 438	13 06
4268 915	0 153	1 895	2 029	14 55	0 134	1 664	1 792	13 83	0 107	1 323	1 437	13 05
4276 836	0.152	1 882	2 016	14 46	0 136	1 679	1 807	13 95	0 106	1 311	1 425	12 94
4284 838	0 153	1 889	2 023	14 51	0 136	1 678	1 806	13 94	0 105	1 296	1 410	12 81
4287 566	0 152	1 876	2 010	14 41	0 136	1 677	1 805	13 93	0 106	1 308	1 422	12 92
4288 310	0 152	1 875	2 009	14 41	0 135	1 665	1 793	13 84	0 105	1 294	1 408	12 79
4290 377	0 151	1 861	1 995	14 31	0 132	1 627	1 755	13 55	0 103	1 270	1 384	12 57
4290 542	0 152	1 873	2 007	14 40	0 132	1 626	1 754	13 54	0 104	1 281	1 395	12 67
4291 630	0 152	1 872	2 006	14 39	0 134	1 648	1 776	13 71	0 104	1 280	1 394	12 66
4294 936	0.153	1 882	2 016	14 46	0 133	1 636	1 764	13 62	0 104	1 280	1 394	12 66

λ	$\phi = 52°1$				$\phi = 52°1$				$\phi = 59°1$			
4196 699	0 072	0 922	1 024	11 83	0 074	0 946	1 040	12 02	0 059	0 755	0 837	11 57
4197 257	0 074	0 918	1 012	11 70	0 073	0 933	1 027	11 87	0 060	0 767	0 849	11 74
4203 730	0 076	0 969	1 063	12 29	0 076	0 969	1 063	12 29	0 063	0 803	0 885	12 23
4209 144	0 075	0 954	1 048	12 11	0 076	0 967	1 061	12 26	0 062	0 789	0 871	12 04
4216 136	0 073	0 926	1 020	11 79	0 074	0 939	1 033	11 94	0 060	0 762	0 844	11 67
4220 509	0 076	0 963	1 057	12 22	0 076	0 963	1 057	12 22	0 062	0 786	0 868	11 99
4232 887	0 077	0 971	1 065	12 31	0 078	0 983	1 077	12 45	0 063	0 789	0 871	12 23
4257 815	0 080	0 999	1 093	12 63	0 080	0 999	1 093	12 63	0 064	0 800	0 882	12 19
4258 477	0 078	0 970	1 064	12 30	0 078	0 973	1 067	12 33	0 063	0 787	0 869	12 01
4265 418	0 078	0 969	1 063	12 29	0 078	0 972	1 066	12 32	0 063	0 785	0 867	11 99
4266 081	0 080	0 996	1 090	12 60	0 078	0 971	1 065	12 31	0 065	0 807	0 889	12,29
4268 915	0 079	0 979	1 073	12 40	0 077	0 956	1 050	12 14	0 064	0 794	0 876	12 11
4276 836	0 078	0 967	1 061	12 26	0 077	0 955	1 049	12 13	0 065	0 806	0 888	12 28
4284 838	0 079	0 976	1 070	12 37	0 078	0 964	1 058	12 23	0 065	0 804	0 886	12 25
4287 566	0 078	0 966	1 060	12 25	0 078	0 964	1 058	12 23	0 064	0 802	0 884	12 22
4288 310	0 078	0 965	1 059	12 24	0 077	0 954	1 048	12 11	0 064	0 791	0 873	12 07
4290 377	0 079	0 974	1 068	12 34	0 077	0 952	1 046	12 09	0 063	0 778	0 860	11 89
4290 542	0 078	0 963	1 057	12 22	0 077	0 952	1 046	12 09	0 063	0 778	0 860	11,89
4291 630	0 079	0 973	1 067	12 33	0 077	0 952	1 046	12 09	0 064	0 789	0 871	12 04
4294 936	0 079	0 973	1 067	12 33	0 078	0 961	1 955	12 19	0 063	0 777	0 859	11 88

TABLE 4 —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 88 1907, June 22, 11^{h} 40^{m} G M T Measured by L on T Distance from Limb 0 6 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	90 4	30 9	30 9	59 1	3 9	1 002
O−Ω	16 0	37 9	37 9	52 1	3 2	1 002
P	6 8	51 4	51 4	38 6	2 6	1 001
D	2 0	66 9	66 9	23 1	2 2	1 001
Diameter	167 0 mm	81 9	81 9	8 1	2 0	1 001
Factor	1 007					

λ	$\phi = 8°1$				$\phi = 23°1$				$\phi = 38°6$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 147	1 878	2 012	14 43	0 128	1 633	1 761	13 59	0 100	1 277	1 391	12 64
4197 257	0 148	1 888	2 022	14 50	0 128	1 633	1 761	13 59	0 099	1 264	1 378	12 52
4203 730	0 150	1 909	2 043	14 65	0 133	1 689	1 817	14 02	0 103	1 311	1 425	12 94
4209 144	0 151	1 917	2 051	14 71	0 131	1 664	1 792	13 83	0 102	1 295	1 409	12 80
4216 136	0 149	1 888	2 022	14 50	0 129	1 635	1 763	13 61	0 101	1 281	1 395	12 67
4220 509	0 152	1 922	2 056	14 74	0 132	1 669	1 797	13 87	0 103	1 303	1 417	12 87
4232 887	0 152	1 914	2 048	14 69	0 132	1 662	1 790	13 82	0 104	1 309	1 423	12 93
4257 815	0 154	1 920	2 054	14 73	0 134	1 668	1 796	13 86	0 105	1 309	1 423	12 93
4258 477	0 153	1 901	2 035	14 59	0 132	1 643	1 771	13 67	0 103	1 281	1 395	12 67
4265 418	0 153	1 899	2 033	14 58	0 132	1 642	1 770	13 66	0 103	1 279	1 393	12 65
4266 081	0 154	1 909	2 043	14 65	0 135	1 677	1 805	13 93	0 105	1 306	1 440	13 08
4268 915	0 154	1 908	2 042	14 64	0 135	1 676	1 804	13 92	0 103	1 276	1 390	12 63
4276 836	0 153	1 894	2 028	14 54	0 132	1 634	1 762	13 60	0 103	1 276	1 390	12 63
4284 838	0 153	1 885	2 019	14 48	0 134	1 654	1 782	13 75	0 104	1 284	1 398	12 70
4287 566	0 153	1 885	2 019	14 48	0 133	1 639	1 767	13 64	0 104	1 283	1 397	12 69
4288 310	0 154	1 896	2 030	14 56	0 133	1 639	1 767	13 64	0 104	1 283	1 397	12 69
4290 377	0 152	1 871	2 005	14 38	0 133	1 638	1 766	13 63	0 104	1 282	1 396	12 68
4290 542	0 152	1 882	2 016	14 46	0 134	1 650	1 778	13 72	0 104	1 281	1 395	12 67
4291 630	0 154	1 894	2 028	14 54	0 134	1 649	1 777	13 72	0 104	1 281	1 395	12 67
4294 936	0 153	1 882	2 016	14 46	0 133	1 636	1 764	13 62	0 104	1 280	1 394	12 66
	$\phi = 52°1$				$\phi = 52°1$				$\phi = 59°1$			
4196 699	0 074	0 949	1 043	12 05	0 073	0 937	1 031	11 92	0 059	0 758	0 840	11 61
4197 257	0 075	0 958	1 052	12 16	0 074	0 946	1 040	12 02	0 060	0 768	0 850	11 75
4203 730	0 076	0 969	1 063	12 28	0 076	0 969	1 063	12 29	0 062	0 790	0 872	12 06
4209 144	0 077	0 979	1 073	12 40	0 076	0 964	1 058	12 23	0 062	0 788	0 870	12 03
4216 136	0 075	0 952	1 046	12 09	0 074	0 939	1 033	11 94	0 060	0 761	0 843	11 65
4220 509	0 077	0 975	1 069	12 36	0 077	0 975	1 069	12 36	0 063	0 797	0 869	12 01
4232 887	0 078	0 983	1 077	12 45	0 078	0 983	1 077	12 45	0 062	0 781	0 863	11 93
4257 815	0 080	0 997	1 091	12 61	0 080	0 996	1 090	12 60	0 066	0 824	0 906	12 43
4258 477	0 079	0 983	1 077	12 45	0 078	0 971	1 065	12 31	0 062	0 772	0 854	11 81
4265 418	0 079	0 982	1 076	12 44	0 079	0 982	1 076	12 44	0 063	0 783	0 865	12 95
4266 081	0 080	0 994	1 088	12 57	0 080	0 994	1 088	12 57	0 064	0 795	0 874	12 12
4268 915	0 079	0 981	1 075	12 42	0 079	0 980	1 076	12 44	0 064	0 794	0 876	12 11
4276 836	0 080	0 992	1 086	12 55	0 080	0 992	1 086	12 55	0 064	0 793	0 875	12 10
4284 838	0 078	0 968	1 062	12 27	0 079	0 979	1 073	12 40	0 064	0 792	0 874	12 08
4287 566	0 080	0 988	1 082	12 51	0 079	0 978	1 072	12 39	0 064	0 791	0 873	12 07
4288 310	0 078	0 966	1 060	12 25	0 080	0 988	1 082	12 51	0 063	0 779	0 861	11 90
4290 377	0 078	0 965	1 059	12 24	0 079	0 976	1 070	12 37	0 063	0 777	0 859	11 88
4290 542	0 079	0 975	1 069	12 36	0 080	0 987	1 081	12 49	0 064	0 789	0 871	12 04
4291 630	0 080	0 986	1 080	12 48	0 080	0 986	1 080	12 48	0 064	0 788	0 870	12 03
4294 936	0 081	0 997	1 091	12 61	0 082	1 010	1 104	12 76	0 063	0 776	0 858	11 86

TABLE 4 —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907—Continued

Plate ω 89 1907, June 22, 12^h 15^m G M T Measured by L on T Distance from Limb 0.6 mm Quality, good

	°	$p-P$ °	π °	ϕ °	η °	sec η
☉	90.4	30.5	30.5	59.5	3.9	1.003
☉−Ω	16.0	37.5	37.5	52.5	3.2	1.002
P	6.8	51.0	51.0	39.0	2.6	1.001
D	2.0	66.5	66.5	23.5	2.2	1.001
Diameter	167.0 mm	81.5	81.5	8.5	2.0	1.001
Factor	1.007					

λ	ϕ = 8°.5				ϕ = 23°.5				ϕ = 39°.0			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196.699	0.146	1.855	1.989	14.28	0.129	1.645	1.773	13.73	0.098	1.261	1.374	12.55
4197.257	0.146	1.855	1.989	14.28	0.128	1.633	1.761	13.63	0.099	1.269	1.382	12.62
4203.730	0.148	1.875	2.009	14.42	0.132	1.680	1.808	13.99	0.101	1.285	1.398	12.79
4209.144	0.147	1.863	1.997	14.34	0.132	1.676	1.804	13.96	0.102	1.295	1.408	12.86
4216.136	0.146	1.850	1.984	14.23	0.130	1.647	1.775	13.75	0.101	1.281	1.394	12.73
4220.509	0.149	1.877	2.011	14.44	0.133	1.682	1.810	14.01	0.104	1.316	1.429	13.05
4232.887	0.148	1.864	1.998	14.35	0.132	1.662	1.790	13.86	0.102	1.285	1.398	12.77
4257.815	0.150	1.871	2.005	14.39	0.136	1.693	1.821	14.10	0.105	1.311	1.424	13.01
4258.477	0.149	1.856	1.990	14.28	0.134	1.667	1.795	13.90	0.104	1.298	1.401	12.80
4265.418	0.150	1.857	1.991	14.29	0.133	1.654	1.782	13.80	0.106	1.317	1.430	13.06
4266.081	0.151	1.870	2.004	14.38	0.137	1.703	1.831	14.17	0.105	1.305	1.418	12.95
4268.915	0.148	1.838	1.972	14.16	0.135	1.672	1.800	13.93	0.104	1.292	1.405	12.84
4276.836	0.150	1.855	1.989	14.28	0.134	1.659	1.787	13.84	0.106	1.309	1.422	12.99
4284.838	0.150	1.853	1.987	14.27	0.134	1.653	1.781	13.79	0.104	1.283	1.396	12.75
4287.566	0.149	1.840	1.974	14.18	0.133	1.639	1.767	13.68	0.106	1.308	1.421	12.98
4288.310	0.148	1.825	1.959	14.06	0.133	1.639	1.767	13.68	0.104	1.281	1.394	12.73
4290.377	0.146	1.800	1.934	13.88	0.132	1.626	1.754	13.58	0.103	1.293	1.406	12.84
4290.542	0.150	1.845	1.979	14.21	0.136	1.673	1.801	13.94	0.106	1.304	1.417	12.94
4291.630	0.150	1.845	1.979	14.21	0.134	1.649	1.777	13.76	0.104	1.280	1.393	12.73
4294.936	0.147	1.845	1.979	14.21	0.133	1.636	1.764	13.66	0.104	1.280	1.393	12.73

λ	ϕ = 52°.5				ϕ = 52°.5				ϕ = 59°.5			
4196.699	0.074	0.950	1.044	12.18	0.076	0.970	1.064	12.41	0.059	0.758	0.838	11.72
4197.257	0.074	0.950	1.044	12.18	0.076	0.970	1.064	12.41	0.060	0.766	0.846	11.83
4203.730	0.076	0.970	1.064	12.41	0.077	0.980	1.074	12.53	0.062	0.792	0.872	12.20
4209.144	0.077	0.980	1.074	12.53	0.078	0.991	1.085	12.66	0.062	0.789	0.869	12.16
4216.136	0.075	0.960	1.054	12.29	0.076	0.967	1.061	12.37	0.061	0.778	0.858	12.00
4220.509	0.077	0.976	1.070	12.48	0.079	0.999	1.093	12.75	0.062	0.786	0.866	12.11
4232.887	0.078	0.984	1.078	12.57	0.078	0.983	1.077	12.56	0.062	0.778	0.858	12.00
4257.815	0.080	1.000	1.094	12.76	0.080	0.998	1.092	12.74	0.065	0.812	0.892	12.48
4258.477	0.079	0.986	1.080	12.60	0.079	0.984	1.078	12.57	0.064	0.794	0.874	12.22
4265.418	0.079	0.985	1.079	12.58	0.081	1.009	1.103	12.86	0.065	0.805	0.885	12.38
4266.081	0.081	1.006	1.100	12.83	0.082	1.020	1.114	12.99	0.064	0.793	0.873	12.21
4268.915	0.080	0.993	1.087	12.68	0.097	0.980	1.074	12.53	0.064	0.792	0.872	12.20
4276.836	0.080	0.993	1.087	12.68	0.080	0.991	1.085	12.66	0.064	0.792	0.872	12.20
4284.838	0.081	1.003	1.097	12.79	0.080	0.988	1.082	12.62	0.065	0.803	0.883	12.35
4287.566	0.080	0.990	1.084	12.64	0.080	0.988	1.082	12.62	0.064	0.791	0.871	12.18
4288.310	0.081	1.000	1.094	12.76	0.081	1.002	1.096	12.78	0.064	0.791	0.871	12.18
4290.377	0.080	0.988	1.082	12.62	0.081	1.000	1.094	12.76	0.063	0.778	0.858	12.00
4290.542	0.080	0.987	1.081	12.61	0.081	1.001	1.094	12.76	0.062	0.767	0.847	11.85
4291.630	0.082	1.011	1.105	12.89	0.081	0.998	1.092	12.74	0.063	0.777	0.857	11.99
4294.936	0.081	0.997	1.091	12.72	0.083	1.021	1.115	13.00	0.063	0.777	0.857	11.99

TABLE 4 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1906–1907 — Continued

Plate ω 90 1907, June 23, $5^h\ 20^m$ G M T Measured by L on T Distance from Limb 1 2 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
☉	91 1	25 5	25 6	64 4	4 6	1 004
☉−Ω	16 7	34 5	34 5	55 5	3 7	1 002
P	6 4	37 0	37 0	53 0	3 4	1 002
D	2 1	52 7	52 7	37 3	2 6	1 001
Diameter	168 1 mm	68 2	68 2	21 8	2 2	1 001
Factor	1 014	83 2	83 2	6 8	2 1	1 001

λ	$\phi = 6°8$				$\phi = 21°8$				$\phi = 37°3$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 149	1 913	2 047	14 64	0 128	1 646	1 775	13 58	0 102	1 312	1 429	12 75
4197 257	0 149	1 913	2 047	14 64	0 129	1 657	1 786	13 67	0 102	1 311	1 428	12 74
4203 730	0 150	1 921	2 055	14 70	0 130	1 666	1 795	13 74	0 103	1 321	1 438	12 83
4209 144	0 151	1 925	2 059	14 72	0 130	1 662	1 791	13 70	0 104	1 330	1 447	12 91
4216 136	0 150	1 913	2 047	14 64	0 129	1 646	1 775	13 58	0 103	1 315	1 432	12 78
4220 509	0 150	1 909	2 043	14 61	0 130	1 655	1 784	13 65	0 104	1 324	1 441	12 86
4232 887	0 151	1 913	2 047	14 64	0 130	1 648	1 777	13 60	0 105	1 332	1 449	12 93
4257 815	0 153	1 920	2 054	14 69	0 131	1 651	1 780	13 62	0 104	1 307	1 424	12 70
4258 477	0 152	1 905	2 039	14 58	0 131	1 648	1 777	13 60	0 106	1 330	1 447	12 91
4265 418	0 152	1 902	2 036	14 56	0 132	1 656	1 785	13 66	0 105	1 318	1 435	12 80
4266 081	0 153	1 913	2 047	14 64	0 132	1 654	1 783	13 64	0 106	1 328	1 445	12 89
4268 915	0 152	1 899	2 033	14 54	0 132	1 650	1 779	13 61	0 106	1 326	1 443	12 88
4276 836	0 152	1 897	2 031	14 52	0 132	1 646	1 775	13 58	0 106	1 322	1 439	12 84
4284 838	0 152	1 894	2 028	14 50	0 132	1 644	1 773	13 57	0 106	1 320	1 437	12 82
4287 566	0 153	1 902	2 036	14 56	0 133	1 654	1 783	13 64	0 106	1 320	1 437	12 82
4288 310	0 153	1 899	2 033	14 54	0 134	1 664	1 793	13 72	0 106	1 318	1 435	12 80
4290 377	0 152	1 886	2 020	14 45	0 133	1 650	1 779	13 61	0 106	1 318	1 425	12 71
4290 542	0 153	1 896	2 030	14 52	0 132	1 652	1 781	13 63	0 107	1 327	1 444	12 88
4291 630	0 152	1 883	2 017	14 42	0 133	1 647	1 776	13 59	0 105	1 302	1 419	12 66
4294 936	0 153	1 894	2 028	14 50	0 133	1 647	1 776	13 59	0 107	1 324	1 441	12 86
	$\phi = 53°0$				$\phi = 55°5$				$\phi = 64°4$			
4196 699	0 074	0 953	1 046	12 34	0 071	0 912	1 002	12 56	0 050	0 644	0 715	11 75
4197 257	0 075	0 964	1 057	12 47	0 072	0 925	1 015	12 72	0 050	0 644	0 715	11 75
4203 730	0 077	0 987	1 080	12 74	0 072	0 924	1 014	12 71	0 051	0 657	0 728	11 96
4209 144	0 076	0 973	1 066	12 58	0 072	0 921	1 011	12 67	0 051	0 655	0 726	11 93
4216 136	0 077	0 983	1 076	12 69	0 072	0 919	1 009	12 65	0 050	0 641	0 712	11 70
4220 509	0 077	0 981	1 074	12 67	0 073	0 930	1 020	12 78	0 051	0 651	0 722	11 86
4232 887	0 077	0 977	1 070	12 62	0 073	0 926	1 016	12 73	0 052	0 661	0 732	12 03
4257 815	0 079	0 993	1 086	12 81	0 075	0 941	1 031	12 92	0 054	0 680	0 751	12 34
4258 477	0 078	0 980	1 073	12 66	0 074	0 928	1 018	12 76	0 052	0 653	0 724	11 90
4265 418	0 078	0 979	1 072	12 65	0 074	0 926	1 016	12 73	0 053	0 665	0 736	12 09
4266 081	0 078	0 977	1 070	12 62	0 074	0 926	1 016	12 73	0 054	0 677	0 748	12 29
4268 915	0 078	0 975	1 068	12 60	0 073	0 912	1 002	12 56	0 054	0 675	0 746	12 26
4276 836	0 078	0 973	1 066	12 58	0 074	0 923	1 013	12 70	0 054	0 674	0 745	12 24
4284 838	0 079	0 984	1 077	12 68	0 076	0 946	1 036	12 99	0 054	0 675	0 746	12 26
4287 566	0 079	0 983	1 076	12 69	0 074	0 922	1 012	12 68	0 054	0 673	0 744	12 22
4288 310	0 080	0 995	1 088	12 83	0 075	0 932	1 022	12 81	0 053	0 661	0 732	12 03
4290 377	0 079	0 981	1 074	12 67	0 073	0 908	0 998	12 51	0 053	0 660	0 731	12 01
4290 542	0 080	0 993	1 086	12 81	0 076	0 943	1 033	12 95	0 054	0 671	0 742	12 19
4291 630	0 079	0 979	1 072	12 65	0 074	0 918	1 008	12 63	0 053	0 658	0 729	11 98
4294 936	0 080	0 991	1 084	12 79	0 074	0 917	1 007	12 62	0 052	0 646	0 717	11 78

The results for Plate ω 91 are given on page 49

In order to arrange the results of Table 4 in a convenient form for effective discussion I have collected the values in three ways (1) mean results for each plate from all lines, (2) mean results for each latitude from all lines, (3) mean results for each line from all plates These summaries are found in Tables 5, 6, and 7 The values of $v + v_1$ and ξ in Table 5 are the means for the separate values given in Table 4. Table 6 is a rearrangement of Table 5 and indicates the combination of points of latitude used in the derivation of normal positions Table 7 is found directly from the values of the individual lines and forms the basis for a discussion of the behavior of the various lines employed

TABLE 5 —MEAN RESULTS FOR EACH PLATE FROM ALL LINES OBSERVATIONS OF 1906–1907

Plate No	Date	No of Lines	ϕ	$v + v_1$	ξ
	1906		°	km	°
ω 3	May 3	20	9 8	2 012	14 49
			24 7	1 805	14 11
			39 7	1 419	13 10
			54 6	1 004	12 31
			69 5	0 598	12 12
			83 6	0 192	12 23
ω 6	May 6	19	10 7	2 035	14 70
			25 7	1 793	14 13
			40 6	1 396	13 05
			55 6	0 990	12 44
			70 4	0 589	12 47
			84 6	0 177	13 35
ω 8	May 19	19	0 9	2 064	14 65
			15 4	1 921	14 52
			30 4	1 702	14 01
			45 4	1 322	13 36
			75 3	0 448	12 53
ω 19	June 12	20	0 1	2 053	14 58
			15 1	1 944	14 29
			30 1	1 675	13 74
			45 1	1 280	12 87
			60 1	0 873	12 44
			75 1	0 460	12 70
ω 20	June 12	20	0 1	2 065	14 66
			15 1	1 930	14 19
			30 1	1 661	13 62
			45 1	1 268	12 75
			60 1	0 867	12 34
			75 1	0 423	11 68
ω 21	June 12	20	0 1	2 059	14 62
			15 1	1 937	14 24
			16 1	1 938	14 31
			30 1	1 665	13 66
			45 1	1 274	12 81
			60 1	0 859	12 24
			75 1	0 428	11 41
ω 23	June 15	20	0 0	2 054	14 58
			15 0	1 934	14 22
			30 0	1 669	13 68
			45 0	1 260	12 65
			59 0	0 857	11 82
			75 0	0 436	11 95
ω 24	June 15	20	0 0	2 065	14 66
			15 0	1 937	14 24
			30 0	1 674	13 72
			45 0	1 272	12 77
			60 0	0 872	12 38
			75 0	0 419	12 04
ω 25	June 15	20	0 0	2 060	14 62
			15 0	1 960	14 41
			30 0	1 663	13 63
			45 0	1 272	12 77
			60 0	0 861	12 22
			75 0	0 437	11 98
	1906		°	km	°
ω 26	June 16	20	0 0	2 073	14 72
			15 0	1 977	14 52
			30 0	1 637	13 41
			45 0	1 276	12 80
			60 0	0 861	12 19
			74 9	0 444	13 12
ω 27	June 16	20	0 0	2 065	14 66
			15 0	1 954	14 36
			30 0	1 657	13 59
			45 0	1 270	12 75
			60 0	0 827	11 74
			74 9	0 435	11 85
ω 30	Oct 19	20	0 1	2 075	14 73
			15 0	1 936	14 22
			30 0	1 646	13 49
			44 8	1 326	13 26
			59 7	0 844	11 88
			74 2	0 416	10 87
ω 31	Oct 19	20	0 1	2 080	14 76
			15 0	1 961	14 41
			30 0	1 678	13 76
			44 8	1 274	12 74
			59 7	0 867	12 20
			74 2	0 450	11 74
ω 35	Nov 11	20	−0 5	2 078	14 75
			74 2	0 482	12 56
ω 36	Nov 11	20	−0 5	2 067	14 68
			14 5	1 980	14 51
			29 4	1 670	13 60
			44 6	1 253	12 49
			59 3	0 850	11 82
			74 2	0 451	11 76
ω 37	Nov 11	20	−0 7	2 073	14 72
			14 3	1 957	14 34
			29 3	1 687	13 75
			44 2	1 266	12 54
			59 2	0 877	12 16
			74 0	0 461	11 88
ω 38	Nov 11	20	−0 7	2 082	14 78
			14 3	1 959	13 35
			29 3	1 677	13 65
			44 2	1 284	12 72
			59 2	0 896	12 42
			74 0	0.485	12 49
ω 39	Nov 11	20	−0 7	2 086	14 81
			14 3	1 964	14 38
			29 3	1 686	13 72
			44 2	1 292	12 79
			59 2	0 896	12 43
			74 0	0.488	12 56
ω 39½	Dec 18	20	0 1	2 101	14 92
			15 1	1 975	14 53
			30 1	1 704	13 99

TABLE 5 —MEAN RESULTS FOR EACH PLATE FROM ALL LINES OBSERVATIONS OF 1906–1907 — Continued

PLATE No	DATE	No OF LINES	ϕ	$v + v_1$	ξ
	1906		°	km	°
ω 40	Dec 18	20	0 1	2 097	14 89
			0 1	2 103	14 93
			15 1	1 974	14 51
			15 1	1 977	14 53
			30 1	1 699	13 94
			30 1	1 704	13 98
ω 41	Dec 18	20	0 1	2 086	14 81
			0 1	2 076	14 74
			15 1	1 957	14 38
			15 1	1 960	14 40
			30 1	1 703	13 97
			30 1	1 690	13 87
ω 46	Dec 18	20	44 4	1 294	12 86
			44 4	1 294	12 86
			44 4	1 298	12 90
			59 4	0 884	12 33
			59 4	0 892	12 44
			59 4	0 892	12 43
ω 47	Dec 18	20	35 4	1 537	13 39
			35 4	1 516	13 20
			44 4	1 308	13 00
			51 9	1 090	12 54
			51 9	1 088	12 53
			59 4	0 897	12 50
	1907				
ω 50	Feb 3	20	7 5	2 011	14 39
			2 3	1 835	14 18
			38 2	1 514	13 68
			54 0	1 014	12 25
			69 5	0 604	12 25
			77 8	0 311	10 44
			77 8	0 333	11 18
ω 55	Feb 15	20	7 5	2 049	14 67
			22 4	1 847	14 18
			38 3	1 464	13 22
ω 56	Feb 15	20	7 5	2 012	14 43
			22 4	1 851	14 20
			38 3	1 454	13 16
			54 0	1 040	12 56
			69 5	0 612	12 41
ω 60	Feb 28	20	6 5	2 043	14 59
			6 5	2 046	14 62
			20 4	1 841	13 94
			28 1	1 679	13 52
			35 0	1 512	13 10
			43 7	1 285	12 62
			50 5	1 091	12 19
ω 61	Feb 28	16	43 7	1 265	12 42
		18	50 5	1 105	12 33
		18	59 5	0 836	11 69
		17	59 5	0 836	11 69
		18	65 3	0 679	11 53
		17	65 3	0 679	11 53
		18	65 3	0 724	12 30
		18	65 3	0 722	12 27
ω 62	Feb 28	20	−6 0	2 042	14 57
			7 9	1 997	14 32
			15 6	1 993	14 69
			22 5	1 789	13 75
			30 2	1 655	13 59
			38 1	1 511	13 64
ω 63	Feb 28	20	7 2	2 056	14 67
			20 6	1 839	13 95
			28 2	1 674	13 48
			35 1	1 535	13 32
			50 7	1 058	11 86
			43 8	1 283	12 63

PLATE No	DATE	No OF LINES	ϕ	$v + v_1$	ξ
	1907		°	km	°
ω 64	Apr 7	20	77 5	0 363	11 92
ω 67	Apr 7	20	77 5	0 371	12 16
ω 78	Apr 7	20	77 5	0 369	12 10
ω 69	Apr 7	20	77 5	0 369	12 10
ω 81	Apr 22	20	67 2	0 656	12 02
			67 2	0 649	11 89
			72 5	0 501	11 83
			72 5	0 497	11 74
			79 5	0 315	12 27
			79 5	0 314	12 24
ω 83	May 10	20	63 5	0 700	11 14
			63 5	0 720	11 45
			74 4	0 465	12.28
			74 4	0 436	11 51
			79 2	0 302	11 44
			79 2	0 300	11 37
ω 85	May 30	20	63 8	0 730	11 74
			63 8	0 722	11 62
			74 8	0 454	12 30
			74 8	0 462	12 52
ω 85	May 30	20	63 8	0 782	12 58
			63 8	0 792	12 75
			74 8	0 474	12 82
			74 8	0 464	12 56
			79 8	0 291	11 67
			79 8	0 289	11 58
ω 86	May 31	20	14 8	1 966	14 44
		19	29 8	1 668	13 65
		20	44 8	1 304	13 04
		20	64 1	0 770	12 52
		20	76 1	0 408	12 06
		20	81 1	0 268	12 28
ω 87	June 22	20	8 1	2 020	14 49
			23 1	1 793	13 84
			38 6	1 411	12 82
			52 1	1 059	12 24
			52 1	1 055	12 20
			59 1	0 869	12 01
ω 88	June 22	20	8 1	2 031	14 56
			23 1	1 780	13 73
			38 6	1 401	12 74
			52 1	1 071	12 38
			52 1	1 071	12 38
			59 1	0 867	12 00
ω 89	June 22	20	8 5	1 986	14 26
			23 5	1 787	13 84
			39 0	1 405	12 84
			52 5	1 079	12 59
			52 5	1 086	12 67
			59 5	0 866	12 11
ω 90	June 23	20	6 8	2 039	14 58
			21 8	1 782	13 63
			37 3	1 437	12 82
			55 5	1 015	12 71
			53 0	1 073	12 66
			64 4	0 732	12 03
ω 91	June 23	20	6 8	2 034	14 55
			21 8	1 804	13 80
			37 3	1 447	12 91
			53 0	1 089	12 84

TABLE 6 — MEAN RESULTS FOR EACH LATITUDE FROM ALL LINES OBSERVATIONS OF 1906–1907

Plate No	ϕ	$v+v_1$	ξ
	°	km	°
ω 8	0 9	2 064	14 65
19	0 1	2 053	14 58
20	0 1	2 065	14 66
21	0 1	2 059	14 62
23	0 0	2 054	14 58
24	0 0	2 065	14 66
25	0 0	2 060	14 62
26	0 0	2 073	14 72
27	0 0	2 065	14 66
30	0 1	2 075	14 73
31	0 1	2 080	14 76
35	0 5	2 078	14 75
36	0 5	2 067	14 68
37	0 7	2 073	14 72
38	0 7	2 082	14 78
39	0 7	2 086	14 81
39½	0 1	2 101	14 92
40	0 1	2 097	14 89
40	0 1	2 103	14 93
41	0 1	2 086	14 81
41	0 1	2 076	14 74
Means	0 2	2 074	14 73
ω 3	9 8	2 012	14 49
6	10 7	2 035	14 70
50	7 5	2 011	14 39
55	7 5	2 049	14 67
56	7 5	2 012	14 43
60	6 5	2 043	14 59
60	6 5	2 046	14 62
62	6 0	2 042	14 57
62	7 9	1 997	14 32
63	7 2	2 056	14 67
87	8 1	2 020	14 49
88	8 1	2 031	14 56
89	8 5	1 986	14 26
90	6 8	2 039	14 58
91	6 8	2 034	14 55
Means	7 7	2 028	14 53
ω 8	15 4	1 921	14 52
19	15 1	1 944	14 29
20	15 1	1 930	14 19
21	15 1	1 937	14 24
21	16 1	1 938	14 31
23	15 0	1 934	14 22
24	15 0	1 937	14 24
25	15 0	1 960	14 41
26	15 0	1 977	14 52
26	15 0	1 977	14 52
27	15 0	1 954	14 36
30	15 0	1 936	14 22
31	15 0	1 961	14 41
36	14 5	1 980	14 51
37	14 3	1 957	14 34
38	14 3	1 959	14 35
39	14 3	1 964	14 38
39½	15 1	1 975	14 53
40	15 1	1 974	14 51
40	15 1	1 977	14 53
41	15 1	1 957	14 38
41	15 1	1 960	14 40
62	15 6	1 993	14 69
86	14 8	1 966	14 44
Means	15 0	1 957	14 40

Plate No	ϕ	$v+v_1$	ξ
	°	km	°
ω 3	24 7	1 805	14 11
6	25 7	1 793	14 13
50	23 3	1 835	14 18
55	22 4	1 847	14 18
56	22 4	1 851	14 20
60	20 4	1 841	13 94
62	22 5	1 789	13 75
63	20 6	1 839	13 95
87	23 1	1 793	13 84
88	23 1	1 780	13 73
89	23 5	1 787	13 84
90	21 8	1 782	13 63
91	21 8	1 804	13 80
Means	22 7	1 811	13 94
ω 8	30 4	1 702	14 01
19	30 1	1 675	13 74
20	30 1	1 661	13 62
21	30 1	1 665	13 66
23	30 0	1 669	13 68
24	30 0	1 674	13 72
25	30 0	1 663	13 63
26	30 0	1 637	13 41
27	30 0	1 657	13 59
30	30 0	1 646	13 49
31	30 0	1 678	13 76
36	29 4	1 670	13 60
37	29 3	1 687	13 75
38	29 3	1 677	13 65
39	29 3	1 686	13 72
39½	30 1	1 704	13 99
40	30 1	1 699	13 94
40	30 1	1 704	13 98
41	30 1	1 703	13 97
41	30 1	1 690	13 87
60	28 1	1 679	13 52
62	30 2	1 655	13 59
63	28 2	1 674	13 48
86	29 8	1 668	13 65
Means	29 8	1 676	13 71
ω 3	39 7	1 419	13 10
3	39 7	1 419	13 10
6	40 6	1 396	13 05
47	35 4	1 537	13 39
47	35 4	1 516	13 20
50	38 2	1 514	13 68
55	38 3	1 464	13 22
56	38 3	1 454	13 16
60	35 0	1 512	13 10
62	38 1	1 511	13 64
63	35 1	1 535	13 32
87	38 6	1 411	12 82
88	38 6	1 401	12 74
89	39 0	1 405	12 84
90	37 3	1 437	12 82
91	37 3	1 447	12 91
Means	37 8	1 461	13 13

Plate No	ϕ	$v+v_1$	ξ
	°	km	°
ω 8	45 4	1 322	13 36
19	45 1	1 280	12 87
20	45 1	1 268	12 75
21	45 1	1 274	12 81
23	45 0	1 260	12 65
24	45 0	1 272	12 77
25	45 0	1 272	12 77
26	45 0	1 276	12 80
27	45 0	1 270	12 75
30	44 8	1 326	13 26
31	44 8	1 274	12 74
36	44 6	1 253	12 49
37	44 2	1 266	12 54
38	44 2	1 284	12 72
39	44 2	1 292	12 79
46	44 4	1 294	12 86
46	44 4	1 294	12 86
46	44 4	1 298	12 90
47	44 4	1 308	13 00
60	43 7	1 285	12 62
61	43 7	1 265	12 42
63	43 8	1 283	12 63
86	44 8	1 304	13 04
Means	44 6	1 283	12 80
ω 3	54 6	1 004	12 31
6	55 6	0 990	12 44
47	51 9	1 090	12 54
47	51 9	1 088	12 53
50	54 0	1 014	12 25
56	54 0	1 040	12 56
60	50 5	1 091	12 19
61	50 5	1 105	12 33
63	50 7	1 058	11 86
87	52 1	1 059	12 24
87	52 1	1 055	12 20
88	52 1	1 071	12 38
88	52 1	1 071	12 38
89	52 5	1 079	12 59
89	52 5	1 086	12 67
90	53 0	1 073	12 66
90	55 5	1 015	12 71
91	53 0	1 089	12 84
Means	52 7	1 060	12 43
ω 19	60 1	0 873	12 44
20	60 1	0 867	12 34
21	60 1	0 859	12 24
23	59 0	0 857	11 82
24	60 0	0 872	12 38
25	60 0	0 861	12 22
26	60 0	0 861	12 19
26	60 0	0 861	12 19
27	60 0	0 827	11 74
30	59 7	0 844	11 88
31	59 7	0 867	12 20
36	59 3	0 850	11 82
37	59 2	0 877	12 16
38	59 2	0 896	12 42
39	59 2	0 896	12 43
46	59 4	0 884	12 33
46	59 4	0 892	12 44
46	59 4	0 892	12 43
47	59 4	0 897	12 50
61	59 5	0 836	11 69
61	59 5	0 836	11 69
87	59 1	0 869	12 01
88	59 1	0 867	12 00
89	59 5	0 866	12 11
Means	59 6	0 867	12 15

Plate No	ϕ	$v+v_1$	ξ
	°	km	°
ω 3	69 5	0 598	12 12
6	70 4	0 589	12 47
50	69 5	0 604	12 25
56	69 5	0 612	12 41
61	65 3	0 679	11 53
61	65 3	0 679	11 53
61	65 3	0 724	12 30
61	65 3	0 722	12 27
81	67 2	0 656	12 02
81	67 2	0 649	11 89
83	63 5	0 700	11 14
83	63 5	0 700	11 14
83	63 5	0 720	11 45
83	63 5	0 720	11 45
85	63 8	0 730	11 74
85	63 8	0 722	11 62
85	63 8	0 782	12 58
85	63 8	0 792	12 75
86	64 1	0 770	12 52
90	64 4	0 732	12 03
Means	65 6	0 694	11 96
ω 8	75 3	0 448	12 53
19	75 1	0 460	12 70
20	75 1	0 423	11 68
21	75 1	0 428	11 81
23	75 0	0 436	11 95
24	75 0	0 439	12 04
25	75 0	0 436	11 98
26	74 9	0 445	12 12
27	74 9	0 435	11 85
30	74 2	0 416	10 87
31	74 2	0 450	11 74
35	74 2	0 482	12 56
36	74 2	0 451	11 76
37	74 0	0 461	11 88
38	74 0	0 485	12 49
39	74 0	0 488	12 56
50	77 8	0 311	10 44
50	77 8	0 333	11 18
64	77 5	0 363	11 92
67	77 5	0 371	12 16
68	77 5	0 369	12 10
69	77 5	0 369	12 10
81	72 5	0 501	11 83
81	72 5	0 497	11 74
83	74 4	0 465	12 28
83	74 4	0 465	12 28
83	74 4	0 436	11 51
83	74 4	0 436	11 51
85	74 8	0 454	12 30
85	74 8	0 462	12 52
85	74 8	0 474	12 82
85	74 8	0 464	12 56
86	76 1	0 408	12 06
Means	75 1	0 435	11 98
ω 3	83 6	0 192	12 23
6	84 6	0 177	13 53
81	79 5	0 315	12 27
81	79 5	0 314	12 24
83	79 2	0 302	11 44
83	79 2	0 302	11 44
83	79 2	0 300	11 37
83	79 2	0 300	11 37
85	79 8	0 291	11 67
85	79 8	0 289	11 58
86	81 1	0 268	12 28
Means	80 4	0 277	11 80

TABLE 7 —MEAN RESULTS FOR EACH LINE FROM ALL PLATES OBSERVATIONS OF 1906–1907

λ	ELEMENT	$\phi = 0°2$			$\phi = 7°7$			$\phi = 15°0$			$\phi = 22°7$		
		No OF PLATES	$v + v_1$	ξ	No OF PLATES	$v + v_1$	ξ	No OF PLATES	$v + v_1$	ξ	No OF PLATES	$v + v_1$	ξ
			km	°		km	°		km	°		km	°
4196 699	*La*	21	2 077	14 75	14	2 022	14 49	24	1 946	14 30	12	1 798	13 84
4197 257	*CN*	21	2 081	14 78	15	2 026	14 51	24	1 957	14 38	13	1 804	13 88
4203 730	*Cr*	21	2 096	14 88	15	2 045	14 65	23	1 974	14 51	13	1 818	13 99
4209 144	*Zr*	21	2 103	14 93	15	2 042	14 63	24	1 977	14 53	13	1 827	14 07
4216 136	*CN*	21	2 057	14 61	15	2 028	14 53	24	1 943	14 28	13	1 799	13 84
4220 509	*Fe*	21	2 089	14 83	15	2 039	14 61	24	1 978	14 54	13	1 824	14 04
4232 887	*Fe*	21	2 089	14 83	15	2 038	14 60	24	1 977	14 53	13	1 824	14 04
4257 815	*Mn*	21	2 090	14 84	15	2 054	14 72	24	1 974	14 51	13	1 832	14 10
4258 477	*Fe*	21	2 074	14 73	15	2 030	14 54	24	1 965	14 45	13	1 810	13 93
4265 418	*Fe*	21	2 075	14 74	15	2 027	14 54	24	1 968	14 46	13	1 805	13 89
4266 081	*Mn*	21	2 080	14 77	15	2 045	14 65	24	1 962	14 42	13	1 830	14 08
4268 915	*Fe*	21	2 072	14 71	15	2 030	14 54	24	1 966	14 45	13	1 814	13 96
4276 836	*–Zr*	21	2 070	14 70	15	2 021	14 48	24	1 954	14 35	13	1 806	13 90
4284 838	*Ni*	21	2 067	14 68	15	2 021	14 48	24	1 958	14 39	13	1 811	13 94
4287 566	*Ti*	21	2 072	14 71	15	2 016	14 44	24	1 956	14 38	13	1 810	13 93
4288 310	*Ti, Fe*	21	2 070	14 70	15	2 016	14 44	24	1 949	14 33	13	1 806	13 90
4290 377	*Ti*	21	2 053	14 58	15	2 003	14 35	24	1 943	14 28	13	1 800	13 85
4290 542	*Fe*	21	2 058	14 62	15	2 016	14 44	24	1 949	14 33	13	1 806	13 90
4291 630	*Fe*	21	2 061	14 63	15	2 010	14 40	24	1 951	14 34	13	1 801	13 86
4294 936	*Zr*	21	2 063	14 65	15	2 018	14 46	24	1 946	14 30	13	1 798	13 84

λ	ELEMENT	$\phi = 29°8$			$\phi = 37°8$			$\phi = 44°6$			$\phi = 52°7$		
4196 699	*La*	24	1 660	13 58	15	1 446	12 97	22	1 266	12 62	16	1 034	12 11
4197 257	*CN*	24	1 674	13 70	16	1 445	12 98	22	1 271	12 67	17	1 037	12 15
4203 730	*Cr*	23	1 693	13 84	16	1 467	13 18	22	1 282	12 78	18	1 057	12 38
4209 144	*Zr*	24	1 698	13 89	16	1 469	13 20	23	1 302	12 98	18	1 057	12 38
4216 136	*CN*	24	1 653	13 52	16	1 451	13 04	23	1 266	12 62	18	1 038	12 16
4220 509	*Fe*	24	1 697	13 88	16	1 470	13 21	23	1 296	12 92	18	1 060	12 42
4232 887	*Fe*	24	1 689	13 82	16	1 465	13 16	23	1 287	12 83	18	1 058	12 40
4257 815	*Mn*	24	1 694	13 86	16	1 478	13 28	23	1 301	12 97	18	1 075	12 59
4258 477	*Fe*	24	1 682	13 76	16	1 461	13 13	23	1 289	12 85	18	1 063	12 45
4265 418	*Fe*	24	1 678	13 73	16	1 464	13 16	22	1 286	12 82	18	1 061	12 43
4266 081	*Mn*	24	1 687	13 80	16	1 477	13 27	23	1 295	12 91	18	1 078	12 63
4268 915	*Fe*	24	1 676	13 71	16	1 464	13 16	22	1 286	12 82	18	1 059	12 41
4276 836	*–Zr*	24	1 677	13 72	16	1 464	13 16	23	1 281	12 77	18	1 062	12 44
4284 838	*Ni*	24	1 666	13 63	16	1 459	13 11	23	1 282	12 78	18	1 068	12 51
4287 566	*Ti*	24	1 665	13 62	16	1 459	13 11	22	1 280	12 76	18	1 063	12 45
4288 310	*Ti, Fe*	24	1 670	13 66	16	1 462	13 14	23	1 275	12 71	18	1 067	12 50
4290 377	*Ti*	24	1 661	13 59	16	1 451	13 04	23	1 275	12 71	18	1 060	12 42
4290 542	*Fe*	24	1 669	13 65	16	1 457	13 09	23	1 276	12 72	18	1 065	12 48
4291 630	*Fe*	24	1 667	13 64	16	1 459	13 11	23	1 280	12 76	18	1 065	12 48
4294 936	*Zr*	24	1 666	13 63	16	1 462	13 12	23	1 288	12 84	18	1 068	12 51

λ	ELEMENT	$\phi = 59°6$			$\phi = 65°6$			$\phi = 75°1$			$\phi = 80°4$		
4196 699	*La*	22	0 842	11 80	15	0 675	11 65	33	0 407	11 21	11	0 271	11 54
4197 257	*CN*	22	0 848	11 90	16	0 674	11 63	33	0 413	11 41	11	0 269	11 45
4203 730	*Cr*	24	0 871	12 22	20	0 692	11 94	32	0 442	12 20	11	0 283	12 05
4209 144	*Zr*	24	0 877	12 31	20	0 698	12 04	33	0 438	12 09	11	0 280	11 92
4216 136	*CN*	24	0 851	11 94	20	0 673	11 61	33	0 407	11 21	11	0 270	11 49
4220 509	*Fe*	24	0 868	12 17	20	0 693	11 96	33	0 440	12 15	11	0 286	12 18
4232 887	*Fe*	24	0 873	12 25	20	0 698	12 04	33	0 438	12 10	11	0 279	11 88
4257 815	*Mn*	24	0 883	12 39	20	0 710	12 25	33	0 456	12 59	11	0 284	12 09
4258 477	*Fe*	24	0 881	12 36	20	0 698	12 04	33	0 442	12 20	11	0 278	11 83
4265 418	*Fe*	24	0 874	12 26	20	0 694	11 97	33	0 435	12 01	11	0 277	11 79
4266 081	*Mn*	23	0 884	12 40	20	0 707	12 20	33	0 452	12 48	11	0 287	12 22
4268 915	*Fe*	24	0 864	12 12	19	0 703	12 13	33	0 436	12 04	11	0 276	11 75
4276 836	*–Zr*	24	0 869	12 19	20	0 699	12 06	33	0 435	12 01	11	0 276	11 75
4284 838	*Ni*	24	0 864	12 12	20	0 696	12 01	33	0 435	12 01	11	0 276	11 75
4287 566	*Ti*	24	0 874	12 26	20	0 697	12 02	33	0 436	12 04	11	0 279	11 88
4288 310	*Ti, Fe*	24	0 866	12 15	20	0 694	11 97	33	0 437	12 07	11	0 276	11 75
4290 377	*Ti*	24	0 858	12 04	20	0 691	11 93	33	0 431	11 90	11	0 269	11 45
4290 542	*Fe*	24	0 856	12 01	20	0 693	11 96	33	0 437	12 07	11	0 274	11 66
4291 630	*Fe*	24	0 862	12 09	20	0 699	12 06	33	0 448	12 37	11	0 276	11 75
4294 936	*Zr*	24	0 870	12 21	20	0 694	11 96	33	0 434	11 98	11	0 277	11 79

Since a satisfactory discussion of the preceding results involves a comparison with the values obtained during 1908, and the addition of the summaries for the latter at this point would necessarily involve a large amount of repetition and duplication of tables, it has seemed to me preferable to undertake next the detailed consideration of the 1908 observations When these have been brought to the point at which we now leave the 1906–1907 observations, we shall be able to take up the discussion of the two simultaneously and carry them on to advantage in parallel columns Accordingly, we now pass to a consideration of the later results

6 Observations of 1908

It was not intended at the conclusion of the series of observations made with the Snow telescope during 1906–1907 to undertake an extended continuation of the work for a considerable time Two circumstances, however, led to a modification of this plan The first was the completion of the tower telescope and the knowledge we came to have of the decidedly superior advantages possessed by it over the Snow telescope, both as regards astigmatism and changes of focus of the image, and the power and efficiency of the spectroscopic equipment used in connection with it The second was the discovery of the remarkable differences in the period and law of rotation of the sun which are indicated when we compare results given by the hydrogen lines with those derived from the ordinary lines of the general reversing layer (15) This discovery naturally made it desirable to study certain special lines in the spectrum, and at the same time to continue the study of the rotation period for the reversing layer to act as a check on the other results found Moreover, such a determination, when compared with the earlier one of 1906–1907, would be of great value in its bearing on the question first raised by Halm, of a variation in the sun's period of rotation Accordingly, in February, 1908, a new series of observations was begun with the tower telescope

The essential features of the tower telescope are a cœlostat with a mirror 17 inches (43 2 cm) in diameter, mounted on a track running north and south, and an elliptical second mirror 22 25 × 12 75 inches (56 5 × 32 4 cm) in size, used in connection with it, which sends the beam of light received from the cœlostat upon a 12-inch (30 5 cm) visual objective immediately beneath it This objective forms the image of the sun on the slit of the spectrograph 60 feet (18 3 m) below, at a distance of 5 feet (1 5 m) above the level of the ground Two tracks are provided for the cœlostat on the summit of the tower, the instrument being used on the west side for observations during the morning hours, and transferred to the east track in the afternoon Its position north and south on its track is, of course, defined by the declination of the sun Two slow motions are provided for controlling the position of the image, the first by means of an electric motor which rotates the cœlostat mirror slowly, and the second by a handle which turns the second plane mirror about a vertical axis The objective can be focused by the observer from near the end of the spectrograph, by means of a steel tape and hand-wheel, which moves the objective in a vertical direction

Probably the most distinctive feature of this instrument is the great thickness of the two mirrors employed This is the same for both mirrors and amounts to 12 inches (30 5 cm), the object being to provide great resistance to flexure when the surfaces are heated by exposure to sunlight Additional advantages tending to improve the character of the sun's image, which the tower telescope possesses, are the direction of the beam, which is vertical instead of horizontal, and the fact that the path of the beam, due to the formation of the image by a lens, is single instead of double, as would be the case with a concave mirror A fourth advantage, which is probably of great importance, is that the light falls upon the surface of the cœlostat mirror at an elevation of over 60 feet above the surface of the ground, and so is free from many disturbing effects suffered by light which passes close to the surface of the ground As a result of these various points of advantage, the character of the image is on the average considerably superior to that formed by the Snow telescope, and the effect of astigmatism and changes of focus is much less marked As a rule the effect of prolonged exposure to sunlight, at least during the morning hours, is shown by a gradual shortening of the focal length indicating a tendency on the part of the mirrors to become slightly concave (16) This continues to some extent even when the mirrors are covered, and it is probably due to the fact that the edges of the glass become heated from contact with the warm air and expand more

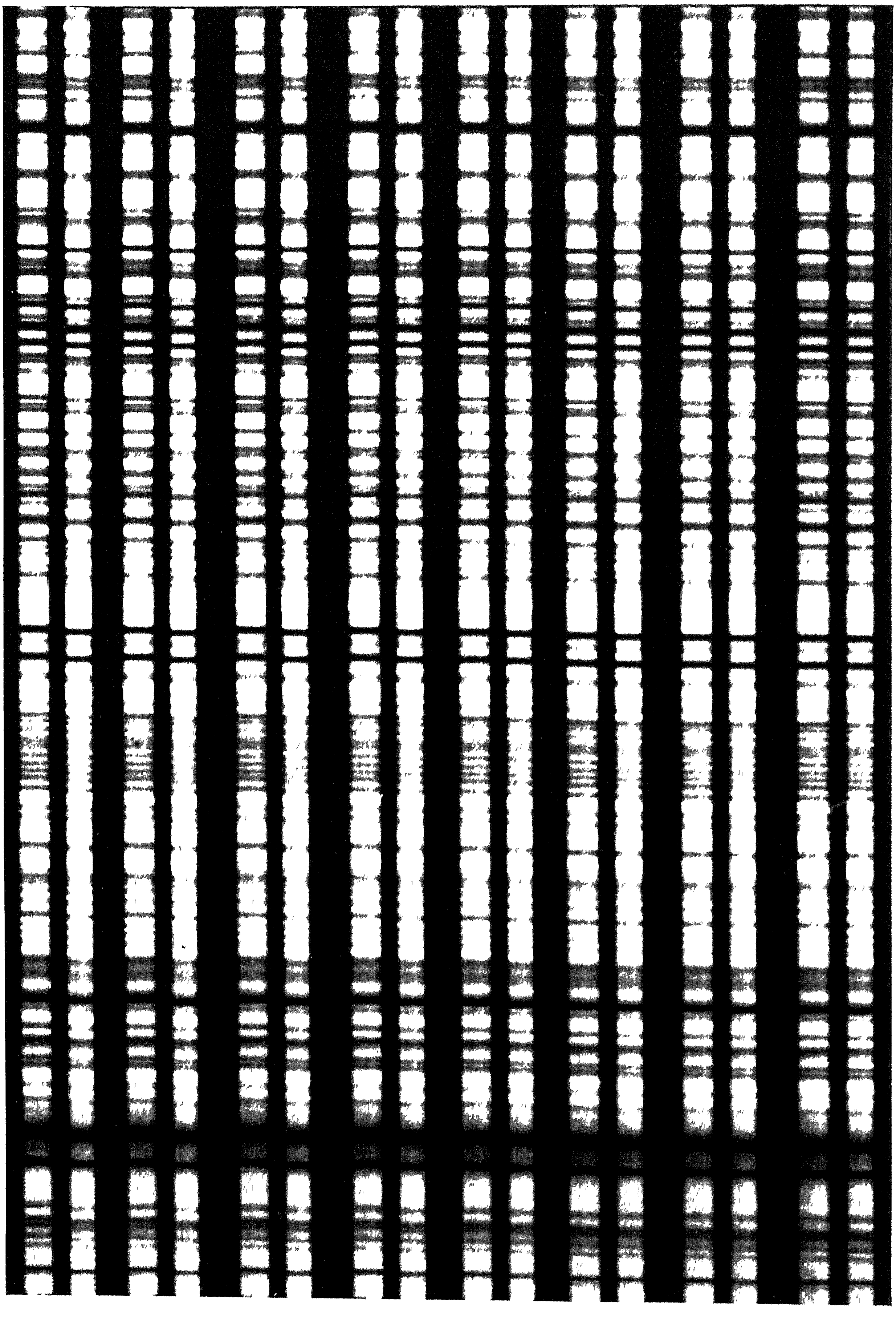
rapidly than the interior of the glass, to which the heat is conducted comparatively slowly The whole effect is very gradual, however, and hardly appreciable during exposures of half an hour

The spectrograph employed with the tower telescope is of 30 feet (9 1 m) focal length, and stands in a vertical position in an underground chamber, the walls of which are lined with concrete The spectrograph is of the auto-collimating type and consists of a skeleton steel tube, at the lower end of which is a heavy casting which carries the lens and the grating mounting The casting terminates in a rounded head which fits into a cup-shaped support in another casting attached to a small pier on the floor of the pit, and this bearing carries practically the entire weight of the spectrograph The top of the instrument consists of a large round plate carrying the slit and plate-holder supports Along the outer edge of this plate there is a circle 30 inches (0 76 m) in diameter, graduated to degrees, and capable of being estimated to within one-tenth of that amount The entire spectrograph, including this plate, can be rotated about a vertical axis by means of a rack and pinion In order to define the upper end of the instrument, there is a large stationary ring in which the plate forming the top of the spectrograph fits closely This carries an index for reading the circle and also serves to support some of the slow-motion handles The lens and the grating are adjusted by handles near the slit, and the focus of the former is read by a small telescope

The diagonal-prism arrangement used to bring the images of the opposite edges of the sun upon the slit is considerably more simple than that used in the observations of 1906–1907 This is due to the fact that since the spectrograph rotates as a whole, the attachment itself requires no provision for motion in position angle, but can be clamped directly to the top of the spectrograph It consists of a small iron casting about 8 inches (20 3 cm) high which is fastened to the spectrograph plate by two taper pins The lower surface of the casting is a few millimeters above the plane of the slit, and to it are attached four small diagonal prisms, two immediately above the slit, and two, at a distance from each other of approximately the sun's diameter, beneath small openings in the casting The distance between the first pair can be varied to allow for variations in the size of the sun's image, and the light from them is received by the second pair of prisms and reflected upon the slit Each prism is mounted independently and provided with adjusting screws The sun's image is centered by means of circles ruled on an aluminium plate fastened to the top of the casting and concentric with the center of the slit The faces of the prisms can be cleaned without removing them from their mountings

With this form of mounting it is evident that the danger of changes in the illumination of the grating surface is much less than in cases where the diagonal prisms themselves are movable I have, however, been careful to maintain the precautions used in the earlier series and have tested the character of the illumination frequently, always before and after the series of exposures, and usually before some of the intermediate exposures The margin of safety for full illumination of the grating surface is approximately the same for this instrument as for the spectrograph used with the Snow telescope The ratio of aperture to focal length for the tower telescope is 1 60 The grating employed with the spectrograph, which is the same as that used in the earlier series of observations, has a ruled surface 3 25 inches (8 3 cm) long In the third order the projection of this surface would be less than 3 inches, to fill which would require a ratio of 1 120 The factor of safety in this case, accordingly, is about 2

Since the grating used in this series of observations is the same as that of the earlier series, it has been possible to make a direct comparison of the plates as regards quality and definition For these photographs the third order has been employed, as against the fourth order previously With a focal length of spectrograph five-thirds as great, however, there is a gain in linear scale approximately in the ratio of 5 4 More exactly, the linear scale of the 1908 plates in the violet is 1 mm = 0 56 Ångstrom, while for the 1906–1907 observations it is 1 mm = 0 71 Ångstrom In spite of this increase in linear scale the lines are decidedly superior on the later plates, a result which is to be attributed in part, no doubt, to the fact that the definition in the third order of this grating is considerably superior to that in the fourth, but probably still more to the excellent conditions of temperature under which the grating is working at the bottom of the deep underground chamber Experiments have shown that the total variation at the bottom of this pit



Spectra used in the Study of the Reversing Layer   Enlargement about 4.8 times

corresponding to a daily range inside the spectroscope house of about 15° C can hardly exceed 0°06 C It is scarcely possible that the grating can have worked under conditions approaching this in excellence when in the horizontal spectrograph in the Snow telescope house The effect of small variations of temperature in the grating during an exposure will eventually be to widen the lines slightly without, in the case of differential determinations of this sort, introducing errors into the displacements, since both spectra are affected alike The accidental errors of measurement will, however, be somewhat greater for the wider lines, and this is no doubt partly accountable for the gain in the internal agreement of the measures on the later plates

The procedure followed in taking the plates differs little from that used in the earlier series, and so does not require very extended consideration The fact that the spectrograph itself is rotated to obtain the position-angle settings for the various latitudes desired has made it possible to secure on all of the plates a position corresponding to the projection of the sun's pole on its visible edge, and this has been used as a most important check on the results for the successive exposures It constitutes a very marked advantage which the later plates possess over those of the earlier series The reference line for the observations is obtained by securing the transits of the sun's image across the 30-inch position circle on the top of the spectrograph, the instrument, of course, being brought to the zero position before the exposures are begun Transits of both edges are taken and the mean value used for the sun's center Three or four separate observations are usually made for these determinations and the mean taken As in the observations with the Snow telescope, experiments have shown no appreciable difference in the results obtained when the cœlostat mirror is rotated, or when the clock is stopped and the image allowed to drift across the circle With a knowledge of the east-and-west line obtained in this way the position of the sun's pole is readily found by reference to a solar ephemeris, and the settings of the position circle corresponding to the latitudes desired are then readily made In general, about the same heliographic latitudes have been observed during the present series as in the series of 1906–1907 The points at 0°, 15°, 30°, 45°, 60°, and 75° are in fact almost exactly comparable At intermediate points somewhat different latitudes have been employed, but the normal positions are sufficiently close to each other to make accurate comparisons simple.

TABLE 8 — LINES OBSERVED IN 1908

λ	ELEMENT	INTENSITY	BEHAVIOR AT LIMB
4196 699	*La*	2	Much weakened
4197 257	*CN*	2	Slightly weakened
4203 730	*Cr*	2	Strengthened and widened
4207 566	*CN*	1 N	Weakened
4216 136	*CN*	1	Weakened
4220 509	*Fe*	3	Slightly strengthened and widened
4232 887	*Fe*	2	Much strengthened and widened
4233 328	*Mn*	4	Much weakened Probably not *Mn* but enhanced line of *Fe*
4257 815	*Mn*	2	Slightly strengthened and widened
4258 477	*Fe*	2	Much strengthened and widened
4265 418	*Fe*	2	Slightly weakened
4266 081	*Mn*	2	Slightly weakened
4268 915	*Fe*	2	Slightly weakened
4276 836	*-Zr*	2	Weakened
4283 169	*Ca*	4	Strengthened and widened.
4284 838	*Ni*	1	Slightly weakened
4287 566	*Ti*	1	Slightly strengthened and widened
4288 310	*Ti, Fe*	1	Widened
4289 525	*Ca*	4	Probably slightly strengthened
4290 377	*Ti*	2	Slightly weakened Enhanced line of *Ti*
4290 542	*Fe*	1	Slightly weakened

A few modifications have been made in the list of lines used in the earlier investigation, with a view to the inclusion of certain lines of especial interest and the omission of some lines in the previous list which have no particular significance The revised list consists of the 22 lines given in Table 8

Of the new lines in the list, λ 4207 566 is included because of its identification in Rowland's table as carbon (more accurately cyanogen) The appearance of the line under high dispersion, however, indicates that it is almost certainly of compound origin, and a similar conclusion is warranted by the size of its displacement at the sun's limb The line λ 4233 328 is of great interest because of being a very strong spark, or enhanced, line of iron and very prominent in the spectrum of the chromosphere Two lines of calcium are added to the list for comparison with the so-called "blue line" at λ 4227, as well as with other lines in the less refrangible part of the spectrum investigated by M Pérot by interference methods (17) Further reference will be made to these results in the course of the discussion

7 Record of Observations, 1908

The details of the observations given in Table 9 are taken from the observing journal and cover the 33 plates used in this investigation The table is essentially the same as that given for the plates of 1906-1907, the principal difference being that in the present series I have measured the diameter of the image and the distance of the slit inside the sun's limb directly, instead of computing them as in the previous case The columns giving these values are found in the table immediately preceding the column containing the observations for zero The use of a lens instead of a concave mirror, as in the case of the Snow telescope, has of course involved a correction in focusing the image on the slit of the spectrograph This is readily found from the shape of the color curve for the lens, and it has been my practice before beginning the observations to focus the image on the slit and then displace the lens by an amount corresponding to this difference for the region under investigation The other columns in the table are self-explanatory

Table 9 — Record of Observations, 1908

Date	Hour G M T	Plate No	Definition	Exposure time	Slit width	Distance inside limb	Diameter of image	Observations for zero	Exposure	Readings position circle
1908	h m			sec	mm	mm	mm	° °		°
Feb 16	11 10	ω 103	4	210	0 038	0 5	172 4	142 1 } – { 322 0	1	42 8
								168 3 } { 348 2	2	27 8
									3	12 8
									4	357 8
									5	342 8
									6	327 8
									7	312 8
Mar 10	7 0	ω 105	5	180	0 045	3 6	171 6	26 5 } – { 206 9	1	74 6
								52 3 } { 232 8	2	59 6
									3	44 6
									4	29 6
									5	14 2
									6	358 3
									7	344 6
									8	343 9
									9	357 4
									10	13 0
									11	28 7
Mar 10	7 50	ω 106	5	150	0 045	3 6	171 6	. . "	1	43 9
									2	58 9
									4	73 9
									5	58 9
									6	43 9
									7	28 7
									8	13 0
									9	357 4
									10	343 9

TABLE 9 —RECORD OF OBSERVATIONS, 1908 — Continued

DATE	HOUR G M T	PLATE No	DEFINITION	EXPOSURE TIME	SLIT WIDTH	DISTANCE INSIDE LIMB	DIAMETER OF IMAGE	OBSERVATIONS FOR ZERO	EXPOSURE	READINGS POSITION CIRCLE
1908	h m			sec	mm	mm	mm	° °		°
April 8	7 45	ω 113	2 3	180	0 030	3 6	171 6	43 4 } – { 223 5	1	330 1
								69 5 } { 249 4	2	343 1
									3	358 8
									4	15 0
									5	30 1
									6	45 1
									7	60 1
May 26	12 0	ω 117	4	90	0 030	1 6	168 7	297 0 } – { 116 5	1	274 2
								271 2 } { 90 8	2	287 7
									3	303 2
									4	319 0
									5	334 2
									6	349 2
									7	364 2
									8	364 2
									9	349 2
									10	334 2
									11	319 0
									12	303 2
									13	287 7
June 2	3 10	ω 120	4	120	0 033	1 2	168 0	61 6 } { 242 5	1	312 7
								87 5 } { 268 3	2	326 2
									3	341 7
									4	357 2
									5	12 7
									6	27 7
									7	42 7
									8	40 7
									9	25 7
									10	10 7
									11	355 2
									12	339 7
									13	324 2
									14	310 7
June 9	12 50	ω 128	2	105	0 033	1 5	166 0	269 3 } – { 88 6	1	270 9
								294 7 } { 114 1	2	285 9
								Taken at $10^h\ 15^m$	3	300 9
									4	315 9
									5	330 9
									6	345 9
									7	0 9
June 10	8 15	ω 132	2	90	0 033	1 4	165 6	62 7 } – { 243 0	1	296 6
								88 4 } { 268 6	2	306 6
								Taken at $3^h\ 0^m$	3	321 6
									4	336 6
									5	351 6
									6	6 6
									7	21 6
June 11	3 0	ω 134	4	90	0 033	2 5	168 0	62 9 } – { 243 6	1	295 8
								88 6 } { 269 3	2	305 8
									3	320 8
									4	335 8
									5	350 8
									6	5 8
									7	20 8
									8	25 8
June 11	4 50	ω 135_1	3	75	0 033	2 1	167 4		1	295 8
									2	305 8
									3	310 8
									4	325 8
									5	340 8
									6	355 8
									7	10 8
									8	25 8

TABLE 9 —RECORD OF OBSERVATIONS, 1908—Continued

DATE	HOUR G M T	PLATE No	DEFINITION	EXPOSURE TIME	SLIT WIDTH	DISTANCE INSIDE LIMB	DIAMETER OF IMAGE	OBSERVATIONS FOR ZERO	EXPOSURE	READINGS POSITION CIRCLE
1908	h m			sec	mm	mm	mm	° °		°
June 11	4 50	135	3	75	0 033	2 1	167 4		1	25 8
									2	10 8
									3	355 8
									4	340 8
									5	325 8
									6	310 8
									7	305 8
									8	295 8
June 11	5 40	ω 136	2	80	0 032	1 8	167 0		1	295 8
									2	305 8
									3	320 8
									4	335 8
									5	350 8
									6	5 8
									7	20 8
									8	25 8
Aug 5	9 50	ω 146	4	50	0 038	1 3	168 6	277 1 } – { 96 8	1	327 8
								302 7 } – { 122 5	2	342 8
									3	357 8
									4	13 3
									5	28 8
									6	44 3
									7	57 8
Aug 5	10 30	ω 147	3	70	0 038	1 4	168 6		1	57 8
									2	44 3
									3	28 8
									4	13 3
									5	357 8
									6	342 8
									7	327 8
Aug 5	10 30	ω 148	3	70	0 038	1 4	168 6		1	327 8
									2	342 8
									3	357 8
									4	13 3
									5	28 8
									6	44 3
									7	57 8
Aug 6	5 15	ω 151	3	70	0 038	1 5	168 6	56 2 } – { 236 7	1	278 4
								82 0 } – { 262 4	2	291 9
									3	307 7
									4	323 2
									5	338 4
									6	353 4
									7	8 4
Aug 26	11 0	ω 161	3	75	0 034	1 1	168 9	105 1 } – { 311 7	1	42 1
								131 1 } – { 285 8	2	17 7
									3	1 7
									4	346 3
									5	331 1
									6	323 6
									7	316 1
Aug 26	11 0	ω 162	3	75	0 034	1 1	168 9		1	316 1
									2	323 6
									3	331 1
									4	346 3
									5	1 7
									6	17 7
									7	42 1

TABLE 9 —RECORD OF OBSERVATIONS, 1908—Continued

DATE	HOUR G M T	PLATE No	DEFINITION	EXPOSURE TIME	SLIT WIDTH	DISTANCE INSIDE LIMB	DIAMETER OF IMAGE	OBSERVATIONS FOR ZERO	EXPOSURE	READINGS POSITION CIRCLE
1908	h m			sec	mm	mm	mm	° °		°
Aug 26	11 55	ω 163	3	90	0 034	1 1	168 9		1	42 1
									2	17 7
									3	1 7
									4	346 3
									5	331 1
									6	323 6
									7	316 1
Aug 26	11 55	ω 164	3	90	0 034	1 1	168 9		1	316 1
									2	323 6
									3	331.1
									4	346 3
									5	1 7
									6	17 7
									7	42 1
Aug 27	6 45	ω 165	3	70	0 030	1 6	168 8	46 0 } — { 253 2	1	280 6
								72 4 } — { 226 8	2	305 0
									3	320 9
									4	336.4
									5	351 6
									6	359 1
									7	6 6
Aug 27	6 45	ω 166	3	70	0 030	1 6	168 8		1	6 6
									2	359 1
									3	351 6
									4	336 4
									5	320 9
									6	305 0
									7	280 6
Sept 30	11 40	ω 179	3	90	0 038	1 0	170 6	124 7 } — { 304 6	5	45 5
								150 8 } — { 330 7	6	45 5
								Taken at $10^h\ 35^m$		
Sept 30	11 40	ω 180	3	90	0 038	1 0	170 6		3	45 5
									4	45 5
Oct 9	11 0	ω 182	4	90	0 038	1 0	170 6	130 4 } — { 310 2	5	314 2
								156 6 } — { 336 4	6	314 2
									7	299 2
									8	291.2
Oct 9	11 0	ω 183	4	95	0 038	1 0	170 6		1	291 2
									2	299 2
									3	314 2
									4	314 2
									5	299 2
									6	291 2
									7	291 2
									8	299 2
Oct 22	6 30	ω 184	4	140	0 041	1 3	171 2	195 5 } — { 15 9	1	305 1
								221 8 } — { 42 3	2	329 1
									3	334 4
									4	344 8
									5	344 8
									6	334 4
									7	329 1
									8	31 1
Oct 22	6 30	ω 185	4	140	0 041	1 3	171 2		1	31 1
									2	329 1
									4	344 8
									5	344 8
									7	329 1
Oct 22	7 45	ω 186	3	140	0 041	1 0	171 2		1	329 1
									3	344 8
									4	31 1
									5	31 1
									8	329 1

The plates used in this investigation have been measured on the same instruments as those of the earlier series, and accordingly the previous discussion of the screw errors of these comparators is directly applicable in the present work The process of measurement has also been identical in the two cases as well as the combination of the individual determinations to form the final means In the present series the inclination of the micrometer wire in the measuring comparator, determined by means of a plate taken with a long slit, is controlled by the exposure secured on the pole of the sun The conversion of the measured displacements into linear velocity is made by means of Table 10, which is very similar to that given for the earlier observations, and differs from it only because of the difference in the linear scale of the plates The quantities correspond to the displacements measured with the Toepfer comparator in units of the half-millimeter

TABLE 10 — CONVERSION OF DISPLACEMENTS INTO VELOCITIES OBSERVATIONS OF 1908

λ	One Revolution in Ångstroms	One Ångstrom in km	One-half Revolution in km	λ	One Revolution in Ångstroms	One Ångstrom in km	One-half Revolution in km
4196 699	0 2996	71 45	10 70	4266 081	0 2984	70 29	10 49
4197 257	0 2996	71 44	10 70	4268 915	0 2984	70 24	10 48
4203 730	0 2995	71 33	10 68	4276 836	0 2984	70 11	10 46
4207 566	0 2994	71 27	10 67	4283 169	0 2982	70 01	10 44
4216 136	0 2992	71 12	10 64	4284 838	0 2982	69 98	10 43
4220 509	0 2992	71 05	10 63	4287 566	0 2982	69 94	10 43
4232 887	0 2988	70 84	10 58	4288 310	0 2982	69 92	10 43
4233 328	0 2988	70 83	10 58	4289 525	0 2982	69 90	10 42
4257 815	0 2986	70 43	10 52	4290 377	0 2982	69 89	10 42
4258 477	0 2986	70 42	10 51	4290 542	0 2982	69 89	10 42
4265 418	0 2984	70 30	10 49	4291 630	0 2982	69 87	10 42

It is unnecessary to consider further the various corrections to be applied to the observed linear velocities to reduce them to the sun's sidereal period of rotation, or the computation of the latitudes, since the process of obtaining these is identical with that used in the previous reductions

Two important respects in which the observations of 1908 have a marked advantage over those in the earlier series have been referred to in the course of the description of the instrument The first of these is in the quality of the sun's image formed by the object-glass of the telescope, and its comparative freedom from astigmatism and changes of focus during the exposures taken upon the plates The importance of this source of error was dwelt upon strongly in the previous discussion of this subject, and the probability that it is largely, if not wholly, eliminated in the case of the tower telescope can not fail to be of the greatest possible value to the results obtained The second advantage is in the relative stability of the diagonal-prism apparatus, which forms the images upon the spectrograph slit, and upon which the illumination of the grating depends With the precautions taken in the first series of observations considerable changes of illumination could hardly have escaped detection, but sufficiently small changes might have done so, and accordingly it is a source of decided satisfaction that in the present series of determinations the danger of error from this source is also greatly reduced A third important consideration has already been referred to, but may well be emphasized again This is the presence on each plate of a spectrum of the edge of the sun corresponding to the projection of the pole This furnishes a practical check on all of the adjustments of the instrument of the type so much to be desired in the measurement of small displacements

8. Results for the Individual Plates, 1908

The results for the individual plates are given in Table 11 in the same form as in Table 4 for the earlier observations, and the symbols employed are the same throughout The sole difference in the constants of reduction used is that the value of the longitude of the ascending node of the sun's equator Ω, has been modified by a slight correction corresponding to the precession for the two years intervening between the two sets of observations The value employed is $74^\circ\ 26'$.

TABLE II — RESULTS FOR INDIVIDUAL PLATES. OBSERVATIONS OF 1908

Plate ω 103 1908, Feb 16, 11^h 10^m G M T Measured by L on T Distance from Limb 0 5 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		0 2				
☉	326 9	14 8	16 3	73 7	25 4	1 107
☉ − ☊	252 4	29 8	30 5	59 5	13 7	1 029
P	17 8	44 8	45 2	44 8	9 8	1 015
D	−6 9	59 8	60 1	29 9	8 0	1 010
Diameter	172 4 mm	74 8	74 9	14 1	7 2	1 008
Factor	1 014	89 8	90 2	−0 2	6 9	1 007

λ	ϕ = −0°2				ϕ = 14°1				ϕ = 29°9			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 177	1 935	2 077	14 75	0 165	1 805	1 944	14 23	0 138	1 512	1 636	13 40
4197 257	0 178	1 945	2 087	14 82	0 165	1 805	1 944	14 23	0 138	1 512	1 636	13 40
4203 730	0 176	1 920	2 062	14 64	0 166	1 810	1 949	14 27	0 140	1 531	1 655	13 55
4207 566	0 177	1 928	2 070	14 70	0 168	1 826	1 965	14 38	0 140	1 542	1 666	13 64
4216 136	0 178	1 935	2 077	14 75	0 169	1 838	1 977	14 47	0 139	1 514	1 638	13 41
4220 509	0 180	1 954	2 096	14 88	0 168	1 827	1 966	14 39	0 140	1 541	1 665	13 64
4232 887	0 180	1 946	2 088	14 83	0 170	1 841	1 980	14 49	0 142	1 538	1 662	13 61
4233 328	0 177	1 913	2 055	14 59	0 170	1 840	1 979	14 49	0 140	1 518	1 642	13 45
4257 815	0 183	1 965	2 107	14 96	0 172	1 845	1 984	14 52	0 142	1 528	1 652	13 53
4258 477	0 179	1 922	2 064	14 65	0 171	1 835	1 974	14 45	0 140	1 504	1 628	13 33
4265 418	0 180	1 928	2 070	14 70	0 167	1 787	1 926	14 10	0 140	1 503	1 627	13 32
4266 081	0 182	1 950	2 092	14 85	0 171	1 832	1 971	14 43	0 144	1 546	1 670	13 68
4268 915	0 180	1 926	2 068	14 69	0 168	1 796	1 935	14 16	0 137	1 470	1 594	13 05
4276 836	0 182	1 945	2 087	14 82	0 168	1 795	1 934	14 15	0 142	1 517	1 641	13 44
4283 169	0 178	1 898	2 040	14 48	0 169	1 801	1 940	14 20	0 142	1 517	1 641	13 44
4284 838	0 180	1 920	2 062	14 64	0 171	1 821	1 960	14 35	0 140	1 497	1 621	13 28
4287 566	0 181	1 927	2 069	14 70	0 169	1 800	1 939	14 19	0 142	1 515	1 639	13 42
4288 310	0 182	1 939	2 081	14 78	0 167	1 782	1 921	14 06	0 142	1 515	1 639	13 42
4289 525	0 180	1 917	2 059	14 62	0 166	1 770	1 909	13 97	0 140	1 495	1 619	13 26
4290 377	0 180	1 916	2 058	14 61	0 165	1 760	1 899	13 90	0 138	1 472	1 596	13 07
4290 542	0 180	1 915	2 057	14 60	0 167	1 780	1 919	14 05	0 141	1 504	1 628	13 33
4291 630	0 179	1 905	2 047	14 53	0 170	1 809	1 948	14 26	0 136	1 454	1 578	12 92

λ	ϕ = 44°8				ϕ = 59°5				ϕ = 73°7			
4196 699	0 108	1 189	1.294	12 94	0 060	0 670	0 746	10 44	0 030	0 360	0 402	10 17
4197 257	0 108	1 189	1 294	12 94	0 060	0 670	0 746	10 44	0 032	0 384	0 426	10 78
4203 730	0 109	1 198	1 303	13 03	0 062	0 690	0 766	10 71	0 034	0 407	0 449	11 36
4207 566	0 109	1 191	1 296	12 96	0 062	0 689	0 765	10 70	0 035	0 419	0 461	11 66
4216 136	0 108	1 178	1 283	12 83	0 062	0 689	0 765	10 70	0 034	0 406	0 448	11 33
4220 509	0 108	1 178	1 283	12 83	0 062	0 687	0 763	10 67	0 032	0 382	0 424	10 73
4232 887	0 108	1 176	1 281	12 81	0 064	0 703	0 779	10 90	0 034	0 404	0 446	11 28
4233 328	0 110	1 198	1 303	13 03	0 062	0 684	0 760	10 63	0 032	0 380	0 422	10 67
4257 815	0 112	1 192	1 297	12 97	0 066	0 723	0 779	11 18	0 035	0 413	0 455	11 51
4258 477	0 108	1 168	1 273	12 73	0 065	0 713	0 789	11 04	0 032	0 377	0 419	10 60
4265 418	0 111	1 182	1 287	12 87	0 065	0 711	0 787	11 01	0 032	0 377	0 419	10 60
4266 081	0 110	1 183	1 288	12 88	0 064	0 700	0 776	10 85	0 034	0 401	0 443	11 21
4268 915	0 110	1 182	1 287	12 87	0 065	0 709	0 785	10 98	0 034	0 400	0 442	11 18
4276 836	0 111	1 192	1 297	12 97	0 064	0 699	0 775	10 84	0 034	0 400	0 442	11 18
4283 169	0 110	1 181	1 286	12 86	0 066	0 719	0 795	11 12	0 032	0 375	0 417	10 55
4284 838	0 110	1 183	1 288	12 88	0 066	0 718	0 794	11 11	0 035	0 410	0 452	11 43
4287 566	0 112	1 208	1 313	13 13	0 064	0 698	0 774	10 83	0 035	0 410	0 452	11 43
4288 310	0 112	1 208	1 313	13 13	0 066	0 717	0 793	11 09	0 034	0 398	0 440	11 13
4289 525	0 110	1 181	1 286	12 86	0 064	0 697	0 773	10 81	0 036	0 421	0 463	11 71
4290 377	0 108	1 157	1 262	12 62	0 062	0 674	0 750	10 49	0 034	0 398	0 440	11 13
4290 542	0 108	1 158	1 263	12 63	0 065	0 706	0 782	10 94	0 036	0 421	0 463	11 71
4291 630	0 110	1 179	1 284	12 84	0 064	0 696	0 772	10 80	0 034	0 398	0 440	11 13

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 105_1 1908, March 10, $7^h\ 0^m$ G M T Measured by A on G Distance from Limb 1 8 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		0 3				
☉	349 8	14 0	15 7	74 3	27 7	1 129
☉−☊	275 3	29 9	30 7	59 3	14 2	1 032
P	23 9	45 3	45 8	44 2	10 1	1 016
D	−7 2	60 3	60 6	29 4	8 3	1 011
Diameter	171 6 mm	75 3	75 4	14 6	7 4	1 008
Factor	1 021	90 3	90 3	−0 3	7 2	1 008

λ	$\phi = -0°3$				$\phi = 14°6$				$\phi = 29°4$				$\phi = 44°2$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 170	1 880	2 020	14 31	0 170	1 880	2 016	14 79	0 136	1 508	1 631	13 29	0 111	1 237	1 338	13 25
4197 257	0 170	1 880	2 020	14 31	0 168	1 814	1 950	14 31	0 132	1 463	1 586	12 92	0 112	1 248	1 349	13 36
4203 730	0 176	1 942	2 082	14 77	0 168	1 854	1 990	14 60	0 136	1 505	1 628	13 27	0 112	1 245	1 346	13 33
4207 566	0 168	1 852	1 902	14 14	0 170	1 874	2 010	14 74	0 132	1 459	1 582	12 89	0 110	1 221	1 322	13 09
4216 136	0 172	1 890	2 030	14 39	0 168	1 848	1 984	14 55	0 128	1 410	1 533	12 49	0 108	1 197	1 298	12 85
4220 509	0 172	1 889	2 029	14 38	0 168	1 846	1 982	14 53	0 139	1 419	1 642	13 37	0 113	1 239	1 340	13 27
4232 887	0 176	1 924	2 064	14 64	0 172	1 881	2 017	14 80	0 136	1 492	1 615	13 16	0 110	1 212	1 313	13 00
4233 328	0 172	1 881	2 021	14 32	0 168	1 836	1 972	14 47	0 136	1 492	1 615	13 16	0 110	1 212	1 313	13 00
4257 815	0 180	1 955	2 095	14 87	0 172	1 869	2 005	14 71	0 140	1 525	1 648	13 43	0 118	1 292	1 393	13 80
4258 477	0 176	1 912	2 052	14 55	0 172	1 869	2 005	14 71	0 142	1 548	1 671	13 62	0 116	1 271	1 372	13 58
4265 418	0 174	1 886	2 026	14 41	0 172	1 865	2 001	14 68	0 138	1 500	1 623	13 23	0 116	1 268	1 369	13 55
4266 081	0 178	1 930	2 070	14 69	0 168	1 821	1 957	14 36	0 136	1 476	1 599	13 02	0 112	1 223	1 324	13 11
4268 915	0 180	1 949	2 089	14 83	0 174	1 884	2 020	14 82	0 140	1 520	1 643	13 37	0 116	1 266	1 367	13 53
4276 836	0 180	1 945	2 085	14 80	0 172	1 858	1 994	14 63	0 146	1 582	1 705	13 89	0 114	1 241	1 342	13 29
4283 169	0 180	1 941	2 081	14 77	0.172	1 854	1 990	14 60	0 140	1 513	1 636	13 40	0 116	1 260	1 361	13 47
4284 838	0 180	1 941	2 081	14 77	0 172	1 854	1 990	14 60	0 136	1 470	1 593	12 99	0 112	1 217	1 318	13 05
4287 566	0 180	1 940	2 080	14 76	0 168	1 810	1 946	14 28	0 144	1 556	1 679	13 65	0 117	1 270	1 371	13 57
4288 310	0 178	1 917	2 057	14 59	0 172	1 852	1 988	14 58	0 140	1 512	1 635	13 32	0 116	1 259	1 360	13 46
4289 525	0 180	1 930	2 070	14 75	0 172	1 852	1 988	14 58	0 144	1 554	1 677	13 63	0 118	1 280	1 381	13 67
4290 377	0 176	1 894	2 034	14 42	0 172	1 852	1 988	14 58	0 140	1 511	1 634	13 31	0 108	1 172	1 273	12 59
4290 542	0 180	1 938	2 078	14 74	0 174	1 872	2 008	14 73	0 144	1 554	1 677	13 63	0 119	1 291	1 392	13 78
4291.630	0.184	1 960	2 100	14 91	0 170	1 830	1 966	14 43	0 146	1 576	1 699	13 84	0 116	1 259	1 360	13 46

λ	$\phi = 59°3$				$\phi = 74°3$				$\phi = -0°3$*				$\phi = 14°6$*			
4196 699	0 066	0 749	0 820	11 40	0 029	0 372	0 408	10 70	0 173	1 909	2 049	14 54	0 163	1 800	1 936	14 21
4197 257	0 070	0 794	0 865	12 03	0 029	0 372	0 408	10 70	0 177	1 952	2 092	14 86	0 164	1 809	1 945	14 28
4203 730	0 070	0 790	0 861	11 97	0 031	0 398	0 434	11 39	0 177	1 948	2 088	14 83	0 165	1 816	1 952	14 33
4207.566	0 066	0 745	0 816	11 35	0 027	0 346	0 382	10 02	0 176	1 936	2 076	14 74	0 166	1 825	1 961	14 39
4216 136	0 068	0 765	0 836	11 63	0 028	0 356	0 392	10 28	0 178	1 952	2 092	14 86	0 168	1 843	1 979	14 52
4220 509	0 070	0 787	0 858	11 93	0 033	0 418	0 454	11 91	0 179	1 960	2 100	14 90	0 167	1 829	1 965	14 42
4232 887	0 068	0 763	0 834	11 60	0 031	0 394	0 430	11 28	0 178	1 942	2 082	14 78	0 168	1 832	1 968	14 44
4233 328	0 066	0 741	0 812	11 29	0 028	0 355	0 391	10 26	0 178	1 942	2 082	14 78	0 170	1 854	1 990	14 61
4257 815	0 072	0 802	0 873	12 14	0 032	0 402	0 438	11 49	0 182	1 973	2 113	15 00	0 172	1 863	1 999	14 67
4258 477	0 068	0 758	0 829	11 53	0 028	0 342	0 378	9 92	0 179	1 940	2 080	14 76	0 173	1 874	2 010	14 75
4265 418	0 072	0 800	0 861	11 97	0 032	0 414	0 450	11 81	0 177	1 914	2 054	14 57	0 169	1 827	1 963	14 41
4266.081	0 068	0 756	0 827	11 50	0 032	0 414	0 450	11 81	0 180	1 946	2 086	14 81	0 173	1 869	2 005	14 72
4268 915	0 070	0 778	0 849	11 81	0 035	0 451	0 487	12 78	0 180	1 944	2 084	14 79	0 169	1 823	1 959	14 37
4276 836	0 072	0 798	0 869	12 08	0 032	0 412	0 448	11 75	0 181	1 951	2 091	14 85	0 170	1 832	1 968	14 44
4283 169	0 072	0 796	0 867	12 05	0 030	0 390	0 426	11 18	0 180	1 936	2 076	14 74	0 172	1 849	1 985	14 59
4284 838	0 068	0 752	0 823	11 44	0 030	0 390	0 426	11 18	0 179	1 925	2 065	14 65	0 170	1 827	1 963	14 41
4287 566	0 072	0 796	0 867	12 05	0 030	0 390	0 426	11 18	0 180	1 936	2 076	14 74	0 169	1 816	1 952	14 33
4288.310	0 070	0 774	0 845	11 75	0 029	0 361	0 397	10 42	0 180	1 935	2 075	14 73	0 170	1 826	1 962	14 40
4289 525	0 070	0 774	0 845	11 75	0 029	0 361	0 397	10 42	0 180	1 934	2 074	14 72	0 171	1 838	1 974	14 48
4290 377	0 072	0 794	0 865	12 03	0 030	0 386	0 422	11 07	0 179	1 922	2 062	14 63	0 172	1 847	1 983	14 55
4290 542	0 072	0 794	0 865	12 03	0 029	0 360	0 396	10 39	0 180	1 932	2 072	14 71	0 172	1 846	1 982	14 54
4291 630	0 070	0 773	0 844	11 74	0 028	0 349	0 385	10 10	0 182	1 953	2 093	14 87	0 171	1 836	1 972	14 47

* Measured by L on T

The results for Plate ω 105_1 are continued on page 70

TABLE II —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 105_2 1908, March 10, 7^h 0^m G M T Measured by A on G and L on Γ, upper half of table by A, lower by L
Distance from Limb 1 8 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	349 8	−0 4				
O−Ω	275 3	59 6	59 9	30 1	8 4	1 011
P	23 9	74 6	74 8	15 2	7 5	1 009
D	−7 2	89 6	90 4	−0 4	7 2	1 008
Diameter	171 6 mm					
Factor	1 021					

λ	$\phi = -0°4$				$\phi = -0°4$				$\phi = 15°2$				$\phi = 30°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 168	1 868	2 008	14 28	0 172	1 913	2 053	14 58	0 164	1 815	1 951	14 35	0 138	1 530	1 653	13 56
4197 257	0 172	1 913	2 053	14 58	0 172	1 903	2 043	14 51	0 166	1 836	1 972	14 51	0 136	1 519	1 642	13 47
4203 730	0 172	1 898	2 038	14 48	0 178	1 963	2 103	14 94	0 168	1 854	1 990	14 64	0 138	1 526	1 649	13 53
4207 566	0 176	1 951	2 091	14 86	0 172	1 907	2 047	14 54	0 166	1 820	1 956	14 39	0 132	1 459	1 582	12 99
4216 136	0 170	1 868	2 008	14 28	0 172	1 902	2 042	14 50	0 162	1 782	1 918	14 10	0 136	1 498	1 621	13 30
4220 509	0 174	1 911	2 051	14 56	0 176	0 944	2 084	14 79	0 168	1 834	1 970	14 49	0 140	1 541	1 664	13 67
4232 887	0 176	1 936	2 076	14 76	0 176	1 924	2 064	14 51	0 168	1 837	1 973	14 51	0 142	1 456	1 579	12 97
4233 328	0 172	1 881	2 021	14 37	0 176	1 914	2 054	14 59	0 168	1 816	1 952	14 36	0 140	1 545	1 668	13 70
4257 815	0 180	1 945	2 085	14 82	0 176	1 923	2 063	14 65	0 166	1 805	1 941	14 27	0 142	1 546	1 669	13 71
4258 477	0 180	1 945	2 085	14 82	0 176	1 945	2 085	14 82	0 172	1 858	1 994	14 67	0 146	1 590	1 713	14 05
4265 418	0 176	1 918	2 058	14 61	0 180	1 908	2 048	14 54	0 168	1 822	1 958	14 40	0 144	1 565	1 688	13 85
4266 081	0 180	1 940	2 080	14 78	0 176	1 940	2 080	14 78	0 168	1 822	1 958	14 40	0 148	1 597	1 720	14 11
4268 915	0 182	1 973	2 113	15 00	0 180	1 971	2 111	14 99	0 166	1 799	1 935	14 23	0 144	1 574	1 697	13 93
4276 836	0 180	1 956	2 096	14 89	0 182	1 935	2 075	14 75	0 170	1 837	1 973	14 51	0 144	1 561	1 684	13 82
4283 169	0 180	1 951	2 091	14 86	0 180	1 941	2 081	14 79	0 168	1 802	1 938	14 25	0 144	1 558	1 681	13 80
4284 838	0 182	1 963	2 103	14 94	0 180	1 941	2 081	14 79	0 160	1 737	1 873	13 79	0 144	1 568	1 691	13 88
4287 566	0 180	1 950	2 090	14 85	0 180	1 929	2 069	14 71	0 168	1 822	1 958	14 40	0 148	1 598	1 721	14 12
4288 310	0 180	1 928	2 068	14 72	0 180	1 938	2 078	14 77	0 168	1 811	1 947	14 32	0 144	1.556	1 679	13 78
4289 525	0 184	1 971	2 111	14 99	0 180	1 948	2 088	14 83	0 172	1 842	1 978	14 55	0 148	1 598	1 721	14 12
4290 377	0 180	1 949	2 089	14 84	0 176	1 884	2 024	14 39	0 168	1 799	1 935	14 23	0 144	1 543	1 666	13 70
4290 542	0 178	1 916	2 056	14 60	0 182	1 958	2 098	14 90	0 170	1 831	1 967	14 47	0 150	1 630	1 753	14 39
4291 630	0 192	1 970	2 110	14 98	0 180	1 937	2 077	14 77	0 168	1 820	1 956	14 39	0 148	1 597	1 720	14 11
	$\phi = -0°4$				$\phi = -0°4$				$\phi = 15°2$				$\phi = 30°1$			
4196 699	0 173	1 909	2 049	14 55	0 170	1 876	2 016	14 32	0 165	1 821	1 957	14 39	0 138	1 526	1 649	13 53
4197 257	0 176	1 942	2 082	14 78	0 172	1 897	2 037	14 47	0 166	1 831	1 967	14 46	0 140	1 547	1 670	13 72
4203 730	0 175	1 926	2 066	14 68	0 175	1 926	2 066	14 68	0 167	1 825	1 961	14 42	0 141	1 551	1 674	13 76
4207 566	0 176	1 935	2 075	14 74	0 177	1 945	2 085	14 80	0 166	1 821	1 957	14 39	0 141	1 550	1 673	13 75
4216 136	0 174	1 908	2 048	14 54	0 176	1 930	2 070	14 70	0 165	1 811	1 947	14 32	0 138	1 517	1 640	13 44
4220 509	0 178	1 945	2 085	14 80	0 177	1 938	2 078	14 76	0 168	1 835	1 971	14 49	0 141	1 548	1 671	13 73
4232 887	0 179	1 952	2 092	14 86	0 178	1 942	2 082	14 78	0 168	1 833	1 969	14 48	0 143	1 564	1 687	13 87
4233 328	0 178	1 942	2 082	14 78	0 176	1 919	2 059	14 63	0 168	1 833	1 969	14 48	0 140	1 530	1 653	13 56
4257 815	0 180	1 951	2 091	14 84	0 180	1 951	2 091	14 84	0 168	1 821	1 957	14 39	0 141	1 532	1 655	13 58
4258 477	0 181	1 961	2 101	14 92	0 180	1 950	2 090	14 83	0 169	1 832	1 968	14 47	0 143	1 547	1 670	13 72
4265 418	0 179	1 935	2 075	14 74	0 179	1 935	2 075	14 74	0 170	1 833	1 969	14 48	0 143	1 547	1.670	13 72
4266 081	0 180	1 938	2 078	14 76	0 178	1 924	2 064	14 66	0 168	1 817	1 953	14 36	0 143	1 547	1 670	13 72
4268 915	0 180	1 937	2 077	14 75	0 180	1 943	2 083	14 78	0 170	1 831	1 967	14 46	0 143	1 545	1 668	13 70
4276 836	0 180	1 937	2 077	14 75	0 179	1 929	2 069	14 70	0 170	1 830	1 966	14 45	0 143	1 545	1 668	13 70
4283 169	0 180	1 935	2 075	14 74	0 180	1 935	2 075	14 74	0 170	1 830	1 966	14 45	0 142	1 531	1 654	13 57
4284 838	0 180	1 935	2 075	14 74	0 180	1 935	2 075	14 74	0 170	1 829	1 965	14 45	0 142	1 531	1 654	13 57
4287 566	0 182	1 957	2 097	14 89	0 180	1 934	2 074	14 73	0 172	1 850	1 986	14 60	0 144	1 554	1 677	13 79
4288 310	0 182	1 956	2 096	14 88	0 181	1 943	2 083	14 78	0 170	1 829	1 965	14 45	0 143	1 540	1 663	13 65
4289 525	0 181	1 945	2 085	14 80	0 181	1 944	2 084	14 79	0 171	1 837	1 973	14 51	0 144	1 554	1 677	13 79
4290 377	0 180	1 935	2 075	14 74	0 180	1 931	2 071	14 72	0 170	1 827	1 963	14 43	0 144	1 552	1 675	13 77
4290 542	0 182	1 955	2 095	14 89	0 182	1 955	2 095	14 89	0 172	1 848	1 984	14 59	0 145	1 561	1 684	13 84
4291 630	0 182	1 954	2 094	14 88	0 182	1 954	2 094	14 88	0 172	1 847	1 983	14 58	0 148	1 594	1 717	14 13

TABLE II —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908—Continued

Plate 105_1—Continued Measured by L on T

λ	$\phi = 29^\circ 4$				$\phi = 44^\circ 2$				$\phi = 59^\circ 3$				$\phi = 74^\circ 3$			
	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 139	1 535	1 658	13 51	0 108	1 201	1 302	12 89	0 066	0 746	0 817	11 36	0 028	0 347	0 383	10 05
4197 257	0 138	1 524	1 647	13 43	0 108	1 201	1 302	12 89	0 068	0 767	0 838	11 65	0 028	0 347	0 383	10 05
4203 730	0 139	1 534	1 657	13 50	0 110	1 219	1 320	13 07	0 067	0 754	0 825	11 47	0 026	0 337	0 373	9 79
4207 566	0 141	1 554	1 677	13 66	0 113	1 253	1 354	13 41	0 067	0 754	0 825	11 47	0 027	0 347	0 383	10 05
4216 136	0 138	1 518	1 641	13 37	0 108	1 194	1 295	12 82	0 068	0 763	0 834	11 59	0 027	0 347	0 383	10 05
4220 509	0 140	1 538	1 661	13 54	0 114	1 259	1 360	13 47	0 069	0 770	0 841	11 68	0 028	0 354	0 390	10 23
4232 887	0 143	1 564	1 687	13 75	0 110	1 209	1 310	12 97	0 068	0 759	0 830	11 54	0 028	0 353	0 389	10 21
4233 328	0 142	1 552	1 675	13 65	0 113	1 242	1 343	13 30	0 067	0 748	0 819	11 39	0 029	0 363	0 399	10 47
4257 815	0 143	1 554	1 677	13 66	0 113	1 235	1 336	13 23	0 070	0 772	0 843	11 71	0 030	0 375	0 411	10 78
4258 477	0 140	1 522	1 645	13 40	0 114	1 244	1 345	13 32	0 070	0 772	0 843	11 71	0 031	0 390	0 426	11 18
4265 418	0 142	1 538	1 661	13 53	0 115	1 253	1 354	13 41	0 070	0 771	0 842	11 70	0 028	0 365	0 401	10 52
4266 081	0 142	1 537	1 660	13 52	0 117	1 274	1 375	13 62	0 068	0 752	0 823	11 44	0 030	0 378	0 414	10 86
4268 915	0 142	1 536	1 659	13 51	0 112	1 218	1 319	13 06	0 070	0 770	0 841	11 68	0 028	0 364	0 400	10 49
4276 836	0 142	1 535	1 658	13 50	0 112	1 217	1 318	13 05	0 070	0 770	0 841	11 68	0 029	0 376	0 412	10 81
4283 169	0 144	1 553	1 676	13 66	0 117	1 268	1 369	13 56	0 070	0 770	0 841	11 68	0 029	0 376	0 412	10 81
4284 838	0 141	1 522	1 645	13 40	0 116	1 260	1 361	13 48	0 072	0 793	0 864	12 02	0 029	0 376	0 412	10 81
4287 566	0 142	1 531	1 654	13 48	0 116	12 59	1 360	13 47	0 072	0 793	0 864	12 02	0 028	0 363	0 399	10 47
4288 310	0 143	1 542	1 665	13 56	0 115	1 247	1 348	13 35	0 070	0 770	0 841	11 68	0 028	0 363	0 399	10 47
4289 525	0 143	1 542	1 665	13 56	0 117	1 266	1 367	13 54	0 071	0 780	0 851	11 83	0 028	0 363	0 399	10 47
4290 377	0 142	1 530	1 653	13 47	0 116	1 256	1 357	13 44	0 070	0 769	0 840	11 67	0 028	0 363	0 399	10 47
4290 542	0 143	1 540	1 663	13 54	0 114	1 234	1 335	13 22	0 073	0 801	0 872	12 13	0 030	0 388	0 424	11 12
4291 630	0 145	1 561	1 684	13 72	0 118	1 286	1 387	13 74	0 071	0 779	0 850	11 82	0 030	0 387	0 423	11 10

Plate ω 106 1908, March 10, $7^h 50^m$ G M T Measured by L on T Distance from Limb 1 8 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
☉	349 9	−0 4				
☉−Ω	275 4	13 1	14 9	75 1	29 3	1 147
P	23 9	28 7	29 6	60 4	14 7	1 034
D	−7 2	44 4	44 9	45 1	10 3	1 016
Diameter	171 6 mm	59 6	59 9	30 1	8 4	1 011
Factor	1 021	74 6	74 8	15 2	7 5	1 009

λ	$\phi = 15^\circ 2$				$\phi = 30^\circ 1$				$\phi = 45^\circ 1$ *				$\phi = 60^\circ 4$ *			
	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 166	1 833	1 969	14 49	0 137	1 515	1 638	13 44	0 112	1 248	1 347	13 55	0 064	0 737	0 806	11 58
4197 257	0 166	1 832	1 968	14 48	0 139	1 533	1 656	13 59	0 108	1 204	1 303	13 11	0 064	0 727	0 796	11 45
4203 730	0 169	1 860	1 996	14 67	0 140	1 544	1 667	13 68	0 112	1 256	1 355	13 63	0 066	0 747	0 816	11 72
4207 566	0 168	1 848	1 984	14 60	0 140	1 543	1 666	13 67	0 104	1 155	1 254	13 62	0 064	0 713	0 782	11 23
4216 136	0 166	1 822	1 958	14 41	0 138	1 517	1 640	13 46	0 108	1 186	1 285	12 93	0 068	0 755	0 824	11 84
4220 509	0 168	1 837	1 973	14 52	0 141	1 548	1 671	13 71	0 112	1 239	1 338	13 46	0 068	0 754	0 823	11 83
4232 887	0 168	1 835	1 971	14 50	0 141	1 541	1 664	13 65	0 106	1 168	1 267	12 75	0 064	0 707	0 776	11 14
4233 328	0 168	1 834	1 970	14 49	0 140	1 530	1 653	13 57	0 110	1 212	1 311	13 19	0 066	0 740	0 809	11 62
4257 815	0 169	1 835	1 971	14 50	0 143	1 554	1 677	13 75	0 112	1 237	1 336	13 44	0 066	0 725	0 794	11 42
4258 477	0 170	1 843	1 979	14 56	0 142	1 542	1 665	13 66	0 110	1 204	1 303	13 11	0 064	0 702	0 771	11 08
4265 418	0 169	1 828	1 964	14 46	0 141	1 525	1 648	13 52	0 114	1 245	1 344	13 52	0 066	0 734	0 803	11 54
4266 081	0 170	1 836	1 972	14 51	0 142	1 534	1 657	13 60	0 112	1 234	1 333	13 41	0 066	0 734	0 803	11 54
4268 915	0 170	1 835	1 971	14 50	0 143	1 547	1 670	13 70	0 116	1 254	1 353	13 61	0 066	0 733	0 802	11 53
4276 836	0 170	1 834	1 970	14 49	0 141	1 522	1 645	13 50	0 110	1 198	1 298	13 05	0 066	0 722	0 791	11 40
4283 169	0 169	1 820	1 956	14 40	0 142	1 531	1 654	13 57	0 110	1 196	1 295	13 03	0 066	0 730	0 799	11 49
4284 838	0 170	1 830	1 966	14 47	0 141	1 520	1 643	13 48	0 108	1 174	1 273	12 81	0 064	0 707	0 776	11 15
4287 566	0 172	1 850	1 986	14 61	0 143	1 542	1 665	13 66	0 112	1 184	1 283	12 91	0 066	0 720	0 789	11 34
4288 310	0 170	1 830	1 966	14 47	0 142	1 533	1 656	13 59	0 112	1 226	1 325	13 33	0 066	0 730	0 799	11 49
4289 525	0 171	1 840	1 976	14 54	0 143	1 540	1 663	13 64	0 112	1 205	1 304	13 12	0 062	0 685	0 754	10 83
4290 377	0 170	1 828	1 964	14 46	0 142	1 529	1 652	13 56	0 118	1 161	1 260	12 69	0 064	0 695	0 764	11 07
4290 542	0 171	1 839	1 975	14 53	0 142	1 528	1 651	13 55	0 116	1 247	1 346	13 54	0 064	0 705	0 774	11 12
4291 630	0 172	1 848	1 984	14 60	0 144	1 550	1 673	13 72	0 116	1 247	1 346	13 54	0 064	0 705	0 774	11 12

* Measured by A on G

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 106 — Continued Measured by L on T

λ	$\phi = 75°1$ *				$\phi = 45°1$				$\phi = 60°4$				$\phi = 75°1$			
	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 030	0 377	0 411	11 35	0 108	1 189	1 288	12 96	0 058	0 656	0 725	10 65	0 028	0 351	0 385	10 63
4197 257	0 028	0 366	0 400	11 04	0 108	1 189	1 288	12 96	0 058	0 656	0 725	10 65	0 029	0 361	0 395	10 91
4203 730	0 032	0 400	0 434	11 98	0 108	1 196	1 295	13 03	0 058	0 655	0 724	10 64	0 029	0 361	0 395	10 91
4207 566	0 030	0 376	0 410	11 32	0 108	1 195	1 295	13 02	0 060	0 676	0 745	10 80	0 030	0 369	0 403	11 13
4216 136	0 030	0 375	0 409	11 29	0 109	1 204	1 303	13 11	0 058	0 653	0 722	10 62	0 030	0 369	0 403	11 13
4220 509	0 036	0 437	0 471	13 00	0 108	1 188	1 287	12 95	0 060	0 672	0 741	10 71	0 031	0 380	0 414	11 44
4232 887	0 032	0 414	0 448	12 37	0 108	1 187	1 286	12 94	0 061	0 682	0 751	10 85	0 030	0 368	0 402	11 10
4233 328	0 028	0 335	0 369	10 19	0 109	1 197	1 296	13 04	0 060	0 671	0 741	10 71	0 030	0 368	0 402	11 10
4257 815	0 032	0 392	0 426	11 76	0 110	1 200	1 299	13 07	0 062	0 687	0 756	10 91	0 030	0 366	0 400	11 05
4258 477	0 032	0 392	0 426	11 76	0 110	1 200	1 299	13 07	0 062	0 687	0 756	10 91	0 030	0 366	0 400	11 05
4265 418	0 028	0 360	0 394	10 88	0 108	1 176	1 275	12 83	0 062	0 687	0 756	10 91	0 031	0 376	0 410	11 33
4266 081	0 032	0 393	0 427	11 79	0 112	1 219	1 318	13 26	0 061	0 677	0 746	10 78	0 032	0 386	0 420	11 60
4268 915	0 030	0 370	0 404	11 15	0 109	1 185	1 284	12 92	0 062	0 686	0 755	10 90	0 032	0 386	0 420	11 60
4276 836	0 032	0 380	0 414	11 43	0 108	1 174	1 273	12 81	0 062	0 686	0 755	10 90	0 031	0 375	0 409	11 30
4283 169	0 032	0 379	0 413	11 40	0 110	1 202	1 301	13 09	0 062	0 686	0 755	10 90	0 031	0 375	0 409	11 30
4284 838	0 032	0 379	0 413	11 40	0 109	1 181	1 280	12 95	0 063	0 696	0 765	11 13	0 032	0 386	0 420	11 60
4287 566	0 032	0 379	0 413	11 40	0 110	1 193	1 292	13 00	0 062	0 685	0 754	10 89	0 032	0 386	0 420	11 60
4288 310	0 032	0 379	0 413	11 40	0 110	1 192	1 291	12 99	0 062	0 685	0 754	10 89	0 032	0 385	0 419	11 57
4289 525	0 032	0 402	0 436	12 04	0 110	1 192	1 291	12 99	0 063	0 695	0 764	11 12	0 032	0 385	0 419	11 57
4290 377	0 030	0 368	0 402	11 10	0 110	1 190	1 289	12 97	0 060	0 661	0 730	10 72	0 030	0 364	0 398	10 99
4290 542	0 032	0 368	0 402	11 10	0 112	1 212	1 311	13 19	0 063	0 693	0 762	11 10	0 032	0 384	0 418	11 55
4291 630	0 034	0 389	0 423	11 68	0 112	1 212	1 311	13 19	0 062	0 683	0 752	10 87	0 030	0 363	0 397	10 97

λ	$\phi = 45°1$				$\phi = 60°4$				$\phi = 75°1$			
	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ	Δ	v	$v + v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 108	1 201	1 300	13 08	0 062	0 703	0 772	11 09	0 028	0 351	0 385	10 63
4197 257	0 108	1 201	1 300	13 08	0 062	0 703	0 772	11 09	0 030	0 376	0 410	11 33
4203 730	0 108	1 198	1 297	13 05	0 063	0 713	0 782	11 24	0 030	0 373	0 407	11 24
4207 566	0 110	1 219	1 318	13 26	0 063	0 711	0 780	11 21	0 028	0 349	0 383	10 58
4216 136	0 110	1 215	1 314	13 22	0 064	0 720	0 789	11 34	0 028	0 349	0 383	10 58
4220 509	0 109	1 203	1 302	13 10	0 064	0 719	0 788	11 32	0 029	0 359	0 393	10 86
4232 887	0 110	1 209	1 308	13 16	0 065	0 730	0 799	11 48	0 029	0 359	0 393	10 86
4233 328	0 110	1 209	1 308	13 16	0 067	0 750	0 819	11 77	0 030	0 371	0 405	11 19
4257 815	0 111	1 212	1 311	13 19	0 066	0 734	0 803	11 53	0 032	0 393	0 427	11 79
4258 477	0 110	1 201	1 300	13 08	0 066	0 734	0 803	11 53	0 031	0 380	0 414	11 44
4265 418	0 110	1 200	1 299	13 07	0 067	0 743	0 812	11 67	0 029	0 354	0 388	10 72
4266 081	0 110	1 199	1 298	13 06	0 066	0 732	0 801	11 50	0 032	0 392	0 426	11 77
4268 915	0 111	1 207	1 306	13 14	0 066	0 731	0 800	11 48	0 030	0 365	0 399	11 02
4276 836	0 111	1 204	1 303	13 11	0 066	0 730	0 799	11 47	0 032	0 392	0 426	11 77
4283 169	0 110	1 193	1 292	13 00	0 067	0 740	0 809	11 63	0 031	0 379	0 413	11 41
4284 838	0 110	1 194	1 293	13 01	0 066	0 729	0 798	11 46	0 032	0 391	0 425	11 74
4287 566	0 110	1 194	1 293	13 01	0 066	0 729	0 798	11 46	0 032	0 391	0 425	11 74
4288 310	0 112	1 203	1 302	13 10	0 067	0 738	0 807	11 60	0 032	0 391	0 425	11 74
4289 525	0 111	1 203	1 302	13 10	0 067	0 738	0 807	11 60	0 031	0 380	0 414	11 44
4290 377	0 110	1 193	1 292	13 00	0 065	0 717	0 786	11 30	0 030	0 368	0 402	11 11
4290 542	0 112	1 212	1 311	13 19	0 066	0 728	0 797	11 44	0 030	0 368	0 402	11 11
4291 630	0 111	1 201	1 300	13 08	0 068	0 749	0 818	11 76	0 030	0 367	0 401	11 09

* Measured by A on G.

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 113 1908, April 8, 7[h] 45[m] G M T Measured by A on G Distance from Limb 1 4 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		0 0				
☉	18 6	13 0	14 3	75 7	25 0	1 103
☉−Ω	304 1	28 7	29 3	60 7	12 3	1 024
P	26 5	44 9	45 2	44 8	8 6	1 011
D	−6 0	60 0	60 2	29 8	6 9	1 007
Diameter	170 7 mm	75 0	75 1	14 9	6 2	1 006
Factor	1 017	90 0	90 0	0 0	6 0	1 006

λ	$\phi = 0°0$				$\phi = 14°9$				$\phi = 29°8$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 176	1 919	2 056	14 60	0 164	1 788	1 923	14 12	0 136	1 487	1 611	13 18
4197 257	0 180	1 973	2 110	14 99	0 166	1 820	1 955	14 37	0 140	1 529	1 653	13 56
4203 730	0 182	1 990	2 127	15 11	0 168	1 837	1 972	14 48	0 144	1 567	1 691	13 84
4207 566	0 180	1 967	2 104	14 95	0 164	1 804	1 939	14 24	0 140	1 532	1 656	13 58
4216 136	0 176	1 918	2 055	14 59	0 164	1 788	1 923	14 12	0 138	1 502	1 626	13 30
4220 509	0 180	1 960	2 097	14 89	0 172	1 862	1 997	14 68	0 144	1 562	1 686	13 81
4232 887	0 184	1 984	2 121	15 06	0 172	1 876	2 011	14 78	0 144	1 572	1 696	13 88
4233 328	0 180	1 951	2 088	14 83	0 166	1 800	1 935	14 21	0 136	1 479	1 603	13 12
4257 815	0 184	1 971	2 108	14 98	0 174	1 863	1 998	14 68	0 146	1 566	1 690	13 84
4258 477	0 182	1 960	2 097	14 89	0 172	1 842	1 977	14 52	0 146	1 583	1 707	13 97
4265 418	0 184	1 987	2 124	15 09	0 170	1 827	1 962	14 41	0 148	1 588	1 712	14 01
4266 081	0 184	1 977	2 114	15 02	0 172	1 849	1 984	14 58	0 146	1 573	1 697	13 89
4268 915	0 084	1 975	2 112	15 01	0 172	1 857	1 992	14 63	0 148	1 587	1 711	14 00
4276 836	0 188	2 003	2 140	15 22	0 172	1 854	1 989	14 61	0 148	1 596	1 720	14 07
4283 169	0 184	1 977	2 114	15 02	0 176	1 881	1 202	14 82	0 152	1 627	1 751	14 31
4284 838	0 180	1 934	2 071	14 71	0 176	1 775	1 910	14 03	0 140	1 498	1 622	13 27
4287 566	0 184	1 966	2 103	14 94	0 170	1 816	1 951	14 33	0 144	1 541	1 665	13 60
4288 310	0 184	1 954	2 091	14 85	0 176	1 879	1 201	14 80	0 148	1 572	1 696	13 88
4289 525	0 184	1 965	2 102	14 93	0 172	1 848	1 983	14 57	0 146	1 562	1 686	13 91
4290 377	0 184	1 953	2 090	14 84	0 168	1 794	1 929	14 17	0 148	1 582	1 706	13 96
4290 542	0 184	1 964	2 101	14 93	0 172	1 836	1 970	14 47	0 144	1 551	1 675	13 72
4291 630	0 182	1 942	2 079	14 76	0 172	1 847	1 982	14 56	0 144	1 551	1 675	13 72
	$\phi = 44°8$				$\phi = 60°7$				$\phi - 75°7$			
4196 699	0 104	1 135	1 239	12 39	0 066	0 736	0 810	11 76	0 028	0 325	0 366	10 54
4197 257	0 108	1 202	1 306	13 06	0 066	0 725	0 799	11 60	0 026	0 314	0 355	10 22
4203 730	0 108	1 176	1 280	12 80	0 068	0 745	0 819	11 89	0 024	0 303	0 344	9 92
4207 566	0 104	1 153	1 257	12 57	0 066	0 723	0 797	11 57	0 024	0 302	0 343	9 88
4216 136	0 106	1 161	1 265	12 65	0 068	0 743	0 817	11 86	0 028	0 323	0 364	10 48
4220 509	0 108	1 193	1 297	12 97	0 066	0 731	0 805	11 70	0 028	0 346	0 387	11 14
4232 887	0 116	1 210	1 314	13 14	0 064	0 706	0 780	11 23	0 028	0 321	0 362	10 42
4233 328	0 108	1 187	1 291	12 91	0 064	0 718	0 792	11 50	0 024	0 300	0 341	9 82
4257 815	0 116	1 245	1 349	13 49	0 066	0 724	0 798	11 59	0 028	0 343	0 384	11 06
4258 477	0 112	1 212	1 316	13 16	0 066	0 724	0 798	11 59	0 028	0 332	0 373	10 74
4265 418	0 108	1 167	1 271	12 71	0 064	0 711	0 785	11 40	0 028	0 321	0 362	10 42
4266 081	0 112	1 220	1 324	13 24	0 064	0 711	0 785	11 40	0 028	0 331	0 372	10 72
4268 915	0 110	1 187	1 291	12 91	0 068	0 742	0 816	11 85	0 030	0 352	0 393	11 31
4276 836	0 112	1 206	1 310	13 10	0 070	0 763	0 837	12 15	0 028	0 320	0 361	10 40
4283 169	0 108	1 161	1 265	12 65	0 068	0 751	0 825	11 98	0 028	0 340	0 381	10 97
4284 838	0 110	1 182	1 286	12 86	0 068	0 751	0 825	11 98	0 028	0 330	0 371	10 68
4287 566	0 116	1 246	1 350	13 50	0 066	0 718	0 792	11 50	0 024	0 286	0 327	9 42
4288 310	0 110	1 182	1 286	12 86	0 068	0 728	0 802	11 65	0 026	0 307	0 348	10 02
4289 525	0 116	1 245	1 349	13 49	0 066	0 706	0 780	11 23	0 028	0 317	0 358	10 31
4290 377	0 112	1 202	1 306	13 06	0 064	0 706	0 780	11 23	0 026	0 296	0 337	9 71
4290 542	0 112	1 212	1 316	13 16	0 066	0 716	0 790	11 37	0 026	0 307	0 348	10 02
4291 630	0 112	1 190	1 294	12 94	0 068	0 728	0 802	11 65	0 024	0 296	0 337	9 71

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 113 — Continued. Measured by L on T

λ	$\phi = 0°0$ Δ	v	$v+v_1$	ξ	$\phi = 14°9$ Δ	v	$v+v_1$	ξ	$\phi = 29°8$ Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 175	1 934	2 071	14 70	0 162	1 784	1 919	14 10	0 140	1 533	1 657	13 55
4197 257	0 177	1 935	2 072	14 71	0 166	1 815	1 950	14 33	0 142	1 556	1 680	13 74
4203 730	0 182	1 984	2 121	15 06	0 168	1 834	1 969	14 47	0 144	1 574	1 698	13 89
4207 566	0 179	1 961	2 098	14 89	0 166	1 810	1 945	14 29	0 144	1 572	1 696	13 59
4216 136	0 177	1 924	2 061	14 63	0 168	1 827	1 962	14 41	0 145	1 580	1 704	13 94
4220 509	0 179	1 943	2 080	14 77	0 169	1 835	1 970	14 47	0 145	1 577	1 701	13 92
4232 887	0 180	1 947	2 084	14 79	0 172	1 847	1 982	14 56	0 145	1 571	1 695	13 87
4233 328	0 180	1 945	2 082	14 78	0 168	1 817	1 952	14 34	0 145	1 570	1 694	13 86
4257 815	0 181	1 953	2 090	14 84	0 169	1 825	1 960	14 40	0 146	1 574	1 698	13 89
4258 477	0 181	1 945	2 082	14 78	0 171	1 840	1 975	14 51	0 146	1 571	1 695	13 87
4265 418	0 181	1 939	2 076	14 73	0 171	1 834	1 969	14 47	0 144	1 546	1 670	13 66
4266 081	0 180	1 939	2 076	14 73	0 170	1 825	1 960	14 40	0 145	1 556	1 680	13 74
4268 915	0 180	1 937	2 074	14 72	0 172	1 846	1 981	14 55	0 146	1 566	1 690	13 83
4276 836	0 181	1 925	2 062	14 64	0 171	1 827	1 962	14 41	0 145	1 553	1 677	13 72
4283 169	0 181	1 938	2 075	14 73	0 173	1 848	1 983	14 57	0 144	1 539	1 663	13 61
4284 838	0 183	1 948	2 085	14 80	0 168	1 792	1 927	14 16	0 144	1 537	1 661	13 59
4287 566	0 182	1 940	2 077	14 74	0 171	1 823	1 958	14 38	0 146	1 558	1 682	13 76
4288 310	0 182	1 938	2 075	14 73	0 173	1 843	1 978	14 53	0 145	1 548	1 672	13 68
4289 525	0 184	1 958	2 095	14 87	0 169	1 801	1 936	14 22	0 144	1 537	1 661	13 59
4290 377	0 183	1 947	2 084	14 79	0 169	1 801	1 936	14 22	0 147	1 567	1 691	13 83
4290 542	0 182	1 937	2 074	14 72	0 175	1 860	1 995	14 66	0 148	1 578	1 702	13 92
4291 630	0 183	1 948	2 085	14 80	0 173	1 842	1 977	14 52	0 142	1 514	1 638	13 40

λ	$\phi = 44°8$ Δ	v	$v+v_1$	ξ	$\phi = 60°7$ Δ	v	$v+v_1$	ξ	$\phi = 75°7$ Δ	v	$v+v_1$	ξ
4196 699	0 106	1 165	1 269	12 69	0 064	0 712	0 786	11 42	0 024	0 288	0 329	9 47
4197 257	0 109	1 198	1 302	13 02	0 063	0 701	0 775	11 25	0 026	0 309	0 350	10 07
4203 730	0 110	1 206	1 310	13 10	0 065	0 721	0 795	11 55	0 027	0 319	0 360	10 36
4207 566	0 109	1 195	1 299	12 99	0 066	0 731	0 805	11 69	0 026	0 307	0 348	10 01
4216 136	0 106	1 159	1 263	12 63	0 064	0 708	0 782	11 36	0 027	0 318	0 359	10 33
4220 509	0 108	1 179	1 283	12 83	0 065	0 717	0 791	11 49	0 026	0 307	0 348	10 01
4232 887	0 110	1 196	1 300	13 00	0 066	0 725	0 799	11 60	0 028	0 332	0 373	10 74
4233 328	0 106	1 153	1 257	12 57	0 067	0 737	0 811	11 78	0 028	0 332	0 373	10 74
4257 815	0 111	1 200	1 304	13 04	0 067	0 732	0 806	11 70	0 028	0 330	0 371	10 68
4258 477	0 111	1 199	1 303	13 03	0 066	0 721	0 795	11 55	0 028	0 330	0 371	10 68
4265 418	0 110	1 188	1 292	12 92	0 065	0 710	0 784	11 39	0 026	0 308	0 349	10 04
4266 081	0 113	1 217	1 321	13 21	0 065	0 709	0 783	11 38	0 026	0 308	0 349	10 04
4268 915	0 112	1 206	1 310	13 10	0 067	0 730	0 804	11 66	0 029	0 339	0 379	10 91
4276 836	0 112	1 204	1 308	13 08	0 066	0 718	0 792	11 50	0 028	0 328	0 369	10 62
4283 169	0 110	1 183	1 287	12 87	0 066	0 717	0 791	11 49	0 028	0 328	0 369	10 62
4284 838	0 110	1 182	1 286	12 86	0 066	0 716	0 790	11 48	0 029	0 339	0 380	10 93
4287 566	0 110	1 180	1 284	12 84	0 067	0 727	0 801	11 63	0 028	0 328	0 369	10 62
4288 310	0 110	1 179	1 283	12 83	0 066	0 717	0 791	11 49	0 029	0 338	0 379	10 91
4289 525	0 112	1 200	1 304	13 04	0 066	0 716	0 790	11 48	0 028	0 328	0 369	10 62
4290 377	0 111	0 188	1 292	12 92	0 065	0 705	0 779	11 32	0 026	0 307	0 348	10 01
4290 542	0 112	1 199	1 303	13 03	0 068	0 735	0 809	11 74	0 028	0 328	0 369	10 62
4291 630	0 112	1 199	1 303	13 03	0 066	0 716	0 790	11 48	0 029	0 338	0 379	10 91

TABLE II —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 117_1 1908, May 26, 12^h 0^m G M T Measured by L on T Distance from Limb 1 6 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		0 6				
O	65 3	14 1	14 1	75 9	4 7	1 003
O−Ω	350 1	29 6	29 6	60 4	2 3	1 001
P	17 4	45 4	45 4	44 6	1 6	1 000
D	−1 8	60 6	60 6	29 4	1 4	1 000
Diameter	168 7 mm	75 6	75 6	14 4	1 2	1 000
Factor	1 019	90 6	0 6	−0 6	1 1	1 000

λ	$\phi = -0°6$				$\phi = 14°4$				ϕ = 29°4			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 173	1 887	2 021	14 35	0 159	1 735	1 868	13 69	0 138	1 507	1 632	13 30
4197 257	0 172	1 877	2 011	14 28	0 160	1 745	1 878	13 77	0 138	1 506	1 631	13 30
4203 730	0 176	1 915	2 049	14 55	0 163	1 762	1 895	13 89	0 142	1 545	1 670	13 61
4207 566	0 177	1 924	2 058	14 61	0 161	1 747	1 880	13 78	0 142	1 544	1 669	13 61
4216 136	0 175	1 898	2 032	14 43	0 161	1 745	1 878	13 77	0 139	1 508	1 633	13 31
4220 509	0 178	1 928	2 062	14 64	0 163	1 764	1 897	13 91	0 140	1 517	1 642	13 38
4232 887	0 179	1 930	2 064	14 66	0 164	1 768	1 901	13 94	0 143	1 543	1 668	13 60
4233 328	0 178	1 920	2 054	14 58	0 164	1 767	1 900	13 93	0 141	1 522	1 647	13 43
4257 815	0 182	1 951	2 085	14 80	0 168	1 797	1 930	14 15	0 145	1 554	1 679	13 69
4258 477	0 179	1 918	2 052	14 57	0 165	1 766	1 899	13 92	0 144	1 544	1 669	13 61
4265 418	0 180	1 924	2 058	14 61	0 166	1 767	1 900	13 93	0 143	1 528	1 653	13 47
4266 081	0 181	1 934	2 068	14 68	0 166	1 776	1 909	13 99	0 146	1 560	1 685	13 74
4268 915	0 180	1 920	2 054	14 58	0 166	1 765	1 898	13 91	0 146	1 559	1 684	13 73
4276 836	0 182	1 941	2 075	14 73	0 166	1 765	1 898	13 91	0 143	1 523	1 648	13 43
4283 169	0 178	1 896	2 030	14 41	0 167	1 775	1 908	13 99	0 144	1 532	1 657	13 51
4284 838	0 181	1 924	2 058	14 61	0 166	1 767	1 900	13 93	0 145	1 542	1 667	13 59
4287 566	0 181	1 923	2 057	14 61	0 165	1 743	1 876	13 75	0 144	1 531	1 656	13 50
4288 310	0 182	1 934	2 068	14 68	0 165	1 755	1 888	13 84	0 146	1 552	1 677	13 67
4289 525	0 182	1 933	2 067	14 68	0 165	1 755	1 888	13 84	0 146	1 551	1 676	13 66
4290 377	0 182	1 933	2 067	14 68	0 165	1 754	1 887	13 83	0 146	1 550	1 675	13 65
4290 542	0 182	1 932	2 066	14 67	0 167	1 774	1 907	13 98	0 147	1 561	1 686	13 74
4291 630	0 184	1 954	2 088	14 83	0 166	0 764	1 897	13 90	0 148	1 570	1 695	13 82

λ	$\phi = 44°6$				$\phi = 60°4$				$\phi = 75°9$			
4196 699	0 108	1 178	1 285	12 82	0 068	0 741	0 822	11 82	0 029	0 307	0 355	10 35
4197 257	0 108	1 178	1 285	12 82	0 067	0 731	0 812	11 68	0 028	0 307	0 355	10 35
4203 730	0 108	1 173	1 280	12 77	0 069	0 751	0 832	11 96	0 030	0 329	0 377	10 99
4207 566	0 110	1 194	1 301	12 98	0 073	0 793	0 874	12 57	0 029	0 318	0 366	10 67
4216 136	0 108	1 171	1 278	12 75	0 068	0 738	0 819	11 78	0 029	0 317	0 365	10 64
4220 509	0 110	1 190	1 297	12 94	0 070	0 758	0 839	12 07	0 030	0 327	0 375	10 93
4232 887	0 110	1 186	1 293	12 90	0 070	0 754	0 835	12 01	0 030	0 325	0 373	10 87
4233 328	0 112	1 208	1 315	13 12	0 069	0 744	0 825	11 86	0 029	0 314	0 362	10 55
4257 815	0 112	1 201	1 308	13 04	0 072	0 771	0 852	12 25	0 030	0 322	0 370	10 79
4258 477	0 114	1 221	1 328	13 25	0 070	0 751	0 832	11 96	0 032	0 346	0 394	11 49
4265 418	0 111	1 188	1 295	12 92	0 071	0 758	0 839	12 07	0 031	0 334	0 382	11 14
4266 081	0 112	1 197	1 304	13 01	0 071	0 758	0 839	12 07	0 032	0 344	0 392	11 43
4268 915	0 113	1 206	1 313	13 10	0 070	0 747	0 828	11 91	0 030	0 322	0 370	10 79
4276 836	0 111	1 183	1 290	12 87	0 072	0 768	0 849	12 21	0 030	0 321	0 369	10 76
4283 169	0 112	1 191	1 298	12 95	0 070	0 745	0 826	11 88	0 029	0 310	0 358	10 44
4284 838	0 111	1 180	1 287	12 84	0 070	0 745	0 826	11 88	0 032	0 341	0 389	11 34
4287 566	0 114	1 212	1 319	13 16	0 071	0 755	0 836	12 02	0 030	0 321	0 369	10 76
4288 310	0 113	1 201	1 308	13 04	0 072	0 765	0 846	12 17	0 032	0 341	0 389	11 34
4289 525	0 112	1 191	1 298	12 95	0 071	0 755	0 836	12 02	0 030	0 320	0 368	10 73
4290 377	0 112	1 190	1 297	12 94	0 073	0 776	0 857	12 32	0 030	0 320	0 368	10 73
4290 542	0 114	1 211	1 318	13 15	0 071	0 754	0 835	12 01	0 031	0 330	0 378	11 02
4291 630	0 114	1 211	1 318	13 15	0 072	0 764	0 845	12 15	0 031	0 330	0 378	11 02

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 117₂ 1908, May 26, 12^h 0^m G M T Measured by L on T Distance from Limb 1 6 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		0 6				
⊙	65 3	14 1	14 1	75 9	4 7	1 003
⊙−☊	350 8	29 6	29 6	60 4	2 3	1 001
P	17 4	45 4	45 4	44 6	1 6	1 000
D	−1 1	60 6	60 6	29 4	1 4	1 000
Diameter	168 7 mm	75 6	75 6	14 4	1 2	1 000
Factor	1 019	90 6	0 6	−0 6	1 1	1 000

λ	$\phi = -0°6$				$\phi = 14°4$				$\phi = 29°4$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 174	1 898	2 032	14 43	0 160	1 745	1 878	13 77	0 138	1 506	1 631	13 30
4197 257	0 173	1 887	2 021	14 36	0 160	1 745	1 878	13 77	0 138	1 506	1 631	13 30
4203 730	0 176	1 915	2 049	14 51	0 162	1 760	1 893	13 88	0 142	1 541	1 666	13 58
4207 566	0 177	1 924	2 058	14 61	0 162	1 758	1 891	13 86	0 141	1 530	1 655	13 49
4216 136	0 175	1 898	2 032	14 43	0 162	1 757	1 890	13 86	0 140	1 519	1 644	13 40
4220 509	0 176	1 907	2 041	14 49	0 162	1 755	1 888	13 84	0 142	1 538	1 663	13 56
4232 887	0 180	1 942	2 076	14 74	0 162	1 748	1 881	13 79	0 143	1 544	1 669	13 61
4233 328	0 178	1 920	2 054	14 58	0 164	1 768	1 901	13 94	0 142	1 532	1 657	13 51
4257 815	0 180	1 929	2 063	14 65	0 165	1 768	1 901	13 94	0 144	1 538	1 663	13 56
4258 477	0 180	1 928	2 062	14 64	0 163	1 747	1 880	13 78	0 144	1 537	1 662	13 55
4265 418	0 180	1 924	2 058	14 61	0 164	1 753	1 886	13 83	0 144	1 536	1 661	13 54
4266 081	0 181	1 934	2 068	14 69	0 166	1 769	1 902	13 94	0 144	1 535	1 660	13 53
4268 915	0 181	1 933	2 067	14 68	0 167	1 783	1 916	14 05	0 145	1 545	1 670	13 61
4276 836	0 181	1 929	2 063	14 65	0 168	1 790	1 923	14 10	0 145	1 544	1 669	13 61
4283 169	0 182	1 936	2 070	14 70	0 166	1 765	1 898	13 91	0 144	1 532	1 657	13 51
4284 838	0 182	1 936	2 070	14 70	0 168	1 786	1 919	14 07	0 143	1 521	1 646	13 42
4287 566	0 180	1 913	2 047	14 54	0 165	1 756	1 889	13 85	0 145	1 543	1 668	13 60
4288 310	0.182	1 935	2 069	14 69	0 167	1 777	1 910	14 00	0 147	1 564	1 689	13 77
4289 525	0 182	1 934	2 068	14 69	0 168	1 786	1 919	14 07	0 146	1 552	1 677	13 67
4290 377	0 182	1 933	2 067	14 68	0 166	1 764	1 897	13 91	0 145	1 541	1 666	13 58
4290 542	0 180	1 922	2 056	14 60	0 168	1 784	1 917	14 05	0 149	1 582	1 707	13 91
4291 630	0 183	1 942	2.076	14 74	0 166	1 764	1 897	13 91	0 148	1 572	1 697	13 83

λ	$\phi = 44°6$				$\phi = 60°4$				$\phi = 75°9$			
4196 699	0 108	1 180	1 287	12 84	0 069	0 753	0 834	11 99	0 029	0 317	0 365	10 64
4197 257	0 108	1 181	1 288	12 85	0 068	0 742	0 823	11 84	0 030	0 327	0 375	10 93
4203 730	0 110	1 193	1 300	12 97	0 070	0 762	0 843	12 12	0 029	0 317	0 365	10 64
4207 566	0 109	1 183	1 290	12 87	0 068	0 739	0 820	11 79	0 031	0 335	0 383	11 16
4216 136	0 108	1 172	1 279	12 76	0 066	0 722	0 803	11 55	0 030	0 325	0 372	10 84
4220 509	0 110	1 190	1 297	12 94	0 069	0 748	0 829	11 92	0 030	0 325	0 372	10 84
4232 887	0 109	1 177	1.284	12 81	0 071	0 767	0 848	12 19	0 031	0 334	0 382	11 13
4233 328	0 110	1 187	1 294	12 91	0 070	0 756	0 837	12 04	0 029	0 314	0 362	10 55
4257 815	0 111	1 189	1 296	12 93	0 074	0 791	0 872	12 54	0 032	0 344	0 392	11 43
4258 477	0 111	1 188	1 295	12 92	0 072	0 770	0 851	12 24	0 032	0 343	0 391	11 39
4265 418	0 110	1 178	1 285	12 82	0 071	0 760	0 841	12 09	0 031	0 333	0 381	11 10
4266 081	0 112	1 194	1 301	12 98	0 072	0 769	0 850	12 22	0 032	0 343	0 391	11 39
4268 915	0 112	1 193	1 300	12 97	0 072	0 768	0 849	12 21	0 032	0 343	0 391	11 39
4276 836	0 112	1 193	1 300	12 97	0 071	0 758	0 839	12 07	0 032	0 342	0 390	11 37
4283 169	0 111	1 181	1 288	12 85	0 072	0 770	0 851	12 24	0 032	0 342	0 390	11 37
4284 838	0 112	1 194	1 301	12 98	0 072	0 769	0 850	12 22	0 032	0 344	0 392	11 43
4287 566	0 112	1 193	1 300	12 97	0 073	0 779	0 860	12 36	0 033	0 354	0 402	11 72
4288 310	0 113	1 203	1 310	13 07	0 073	0 777	0 858	12 33	0 032	0 343	0 391	11 39
4289 525	0 112	1 191	1 298	12 95	0 073	0.777	0 858	12 33	0 033	0 353	0 401	11 69
4290 377	0 114	1 211	1 318	13 15	0 072	0 767	0 848	12 19	0 032	0 343	0 391	11 39
4290 542	0 114	1 211	1 318	13 15	0 073	0 776	0 857	12 32	0 032	0 343	0 391	11 39
4291 630	0 113	1 200	1 307	13 04	0 074	0 786	0 867	12 47	0 033	0 352	0.400	11 66

TABLE 11 — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 120_1 1908, June 2, 3^h 10^m G M T Measured by L on T Distance from Limb 1 2 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	71 7	12 7	12 7	77 3	1 6	1 000
O−Ω	357 2	26 2	26 2	63 8	0 8	1 000
P	15 0	41 7	41 7	48 3	0 5	1 000
D	−0 3	57 2	57 2	32 8	0 4	1 000
Diameter	168 0 mm	72 7	72 7	17 3	0 4	1 000
Factor	1 014	87 7	87 7	2 3	0 4	1 000
		102.7	102 7	−12 7	0 4	1 000

λ	$\phi = -12°7$				$\phi = 2°3$				$\phi = 17°3$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 166	1 802	1 932	14 06	0 175	1 894	2 028	14 41	0 158	1 715	1 846	13 74
4197 257	0 166	1 801	1 931	14 05	0 176	1 904	2 038	14 48	0 158	1 715	1 846	13 74
4203 730	0 166	1 798	1 928	14 03	0 175	1 893	2 027	14 40	0 161	1 739	1 870	13 92
4207 566	0 169	1 825	1 955	14 23	0 175	1 893	2 027	14 40	0 160	1 728	1 859	13 84
4216 136	0 168	1 813	1 943	14 14	0 176	1 899	2 033	14 44	0 160	1 726	1 857	13 82
4220 509	0 170	1 832	1 962	14 28	0 178	1 918	2 052	14 58	0 161	1 735	1 866	13 89
4232 887	0 170	1 825	1 955	14 23	0 180	1 932	2 066	14 67	0 162	1 740	1 871	13 93
4233 328	0 170	1 825	1 955	14 23	0 180	1 931	2 065	14 67	0 164	1 759	1 890	14 07
4257 815	0 173	1 841	1 971	14 34	0 180	1 912	2 046	14 54	0 162	1 724	1 855	13 80
4258 477	0 173	1 841	1 971	14 34	0 182	1 931	2 065	14 67	0 162	1 724	1 855	13 80
4265 418	0 172	1 829	1 959	14 26	0 182	1 930	2 064	14 66	0 163	1 733	1 864	13 88
4266 081	0 173	1 841	1 971	14 34	0 182	1 928	2 062	14 65	0 160	1 701	1 832	13 64
4268 915	0 174	1 850	1 980	14 41	0 180	1 909	2 043	14 51	0 164	1 739	1 870	13 92
4276 836	0 169	1 793	1 923	13 99	0 180	1 908	2 042	14 51	0 165	1 746	1 877	13 97
4283 169	0 173	1 830	1 960	14 26	0 182	1 927	2 061	14 64	0 164	1 736	1 867	13 90
4284 838	0 173	1 830	1 960	14 26	0 182	1 925	2 059	14 63	0 164	1 734	1 865	13 88
4287 566	0 173	1 829	1 959	14 26	0 182	1 925	2 059	14 63	0 164	1 734	1 865	13 88
4288 310	0 174	1 843	1 973	14 36	0 183	1 935	2 069	14 70	0 165	1 743	1 874	13 95
4289 525	0 174	1 841	1 971	14 34	0 182	1 923	2 057	14 62	0 165	1 742	1 873	13 94
4290 377	0 173	1 830	1 960	14 26	0 184	1 943	2 077	14 76	0 164	1 732	1 863	13 87
4290 542	0 176	1 860	1 990	14 48	0 183	1 933	2 067	14 69	0 164	1 732	1 863	13 87
4291 630	0 176	1 860	1 990	14 48	0 182	1 923	2 057	14 62	0 162	1 712	1 843	13 72

λ	$\phi = 32°8$				$\phi = 48°3$				$\phi = 63°8$				$\phi = 77°3$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 139	1 499	1 618	13 67	0 096	1 042	1 143	12 20	0 051	0 555	0 628	10 10	0 026	0 282	0 327	10 56
4197 257	0 138	1 498	1 617	13 66	0 096	1 042	1 143	12 20	0 053	0 575	0 648	10 42	0 026	0 282	0 327	10 56
4203 730	0 140	1 516	1 635	13 81	0 098	1 061	1 162	12 40	0 052	0 563	0 636	10 23	0 027	0 292	0 337	10 88
4207 566	0 141	1 521	1 640	13 85	0 098	1 061	1 162	12 40	0 052	0 562	0 635	10 21	0 027	0 291	0 336	10 85
4216 136	0 139	1 501	1 620	13 68	0 098	1 057	1 158	12 36	0 052	0 561	0 634	10 20	0 026	0 280	0 325	10 50
4220 509	0 141	1 520	1 639	13 84	0 102	1 099	1 200	12 81	0 053	0 570	0 643	10 34	0 025	0 270	0 315	10 17
4232 887	0 142	1 524	1 643	13 88	0 100	1 073	1 174	12 53	0 053	0 569	0 642	10 33	0 028	0 300	0 345	11 14
4233 328	0 142	1 524	1 643	13 88	0 100	1 073	1 174	12 53	0 053	0 569	0 642	10 33	0 028	0 300	0 345	11 14
4257 815	0 144	1 535	1 654	13 97	0 101	1 075	1 176	12 55	0 053	0 565	0 638	10 26	0 028	0 297	0 342	11 04
4258 477	0 142	1 511	1 630	13 77	0 102	1 085	1 186	12 66	0 052	0 555	0 638	10 26	0 027	0 287	0 332	10 72
4265 418	0 143	1 521	1 640	13 85	0 100	1 064	1 165	12 43	0 054	0 574	0 647	10 41	0 028	0 297	0 342	11 04
4266 081	0 144	1 525	1 644	13 89	0 103	1 095	1 196	12 76	0 054	0 374	0 647	10 41	0 029	0 307	0 352	11 37
4268 915	0 144	1 525	1 644	13 89	0 101	1 073	1 174	12 53	0 055	0 583	0 656	10 55	0 028	0 296	0 341	11 01
4276 836	0 144	1 524	1 643	13 88	0 100	1 061	1 162	12 40	0 053	0 562	0 635	10 21	0 028	0 296	0 341	11 01
4283 169	0 144	1 524	1 643	13 88	0 100	1 059	1 160	12 38	0 054	0 571	0 644	10 36	0 028	0 296	0 341	11 01
4284 838	0 145	1 534	1 653	13 96	0 102	1 080	1 186	12 66	0 054	0 571	0 644	10 36	0 028	0 296	0 341	11 01
4287 566	0 146	1 544	1 663	14 04	0 100	1 058	1 159	12 37	0 054	0 571	0 644	10 36	0 025	0 265	0 310	10 01
4288 310	0 146	1 544	1 663	14 04	0 103	1 089	1 190	12 70	0 053	0 560	0 633	10 18	0 028	0 295	0 340	10 98
4289 525	0 146	1 543	1 662	14 04	0 103	1 089	1 190	12 70	0 053	0 560	0 633	10 18	0 028	0 295	0 340	10 98
4290 377	0 146	1 543	1 662	14 04	0 102	1 078	1 179	12 58	0 053	0 560	0 633	10 18	0 028	0 295	0 340	10 98
4290 542	0 146	1 543	1 662	14 04	0 104	1 099	1 200	12 81	0 055	0 580	0 653	10 50	0 027	0 285	0 330	10 66
4291 630	0 147	1 553	1 672	14 12	0 104	1 099	1 200	12 81	0 053	0 560	0 633	10 18	0 026	0 275	0 320	10 33

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 120, 1908, June 2, 3^h 10^m G M T Measured by L on T Distance from Limb 1 2 mm Quality, good

	°	$p-P$	π	ϕ	η	sec η
		°	°	°	°	
		10 7	10 7	79 3	1 6	1 000
O	71 7	24 2	24 2	65 8	0 8	1 000
O−Ω	357 2	39 7	39 7	50 3	0 5	1 000
P	15 0	55 2	55 2	34 8	0 4	1 000
D	−0 3	70 7	70 7	19 3	0 4	1 000
Diameter	168 0 mm	85 7	85 7	4 3	0 4	1 000
Factor	1 014	100 7	100 7	−10 7	0 4	1 000

λ	$\phi = -10°7$				$\phi = 4°3$				$\phi = 19°3$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 170	1 844	1 974	14 26	0 175	1 900	2 034	14 48	0 156	1 693	1 824	13 74
4197 257	0 170	1 844	1 974	14 26	0 176	1 910	2 044	14 56	0 156	1 693	1 824	13 74
4203 730	0 172	1 862	1 992	14 39	0 177	1 916	2 050	14 60	0 159	1 722	1 853	13 96
4207 566	0 173	1 872	2 002	14 46	0 176	1 904	2 038	14 51	0 160	1 731	1 862	14 02
4216 136	0 174	1 877	2 007	14 50	0 174	1 878	2 012	14 33	0 157	1 693	1 824	13 74
4220 509	0 176	1 897	2 027	14 64	0 180	1 940	2 074	14 77	0 160	1 719	1 850	13 93
4232 887	0 176	1 888	2 018	14 58	0 178	1 910	2 044	14 56	0 159	1 707	1 838	13 84
4233 328	0 174	1 867	1 997	14 43	0 178	1 910	2 044	14 56	0 160	1 717	1 848	13 92
4257 815	0 177	1 887	2 017	14 57	0 181	1 918	2 052	14 61	0 161	1 708	1 839	13 85
4258 477	0 176	1 876	2 006	14 49	0 180	1 908	2 042	14 54	0 161	1 707	1 838	13 84
4265 418	0 177	1 887	2 017	14 57	0 180	1 904	2 038	14 51	0 160	1 697	1 828	13 77
4266 081	0 177	1 886	2 016	14 56	0 181	1 916	2 050	14 60	0 162	1 716	1 847	13 91
4268 915	0 178	1 896	2 026	14 64	0 180	1 906	2 040	14 53	0 162	1 715	1 846	13 90
4276 836	0 176	1 867	1 997	14 43	0 180	1 905	2 039	14 52	0 160	1 694	1 825	13 75
4283 169	0 178	1 884	2 014	14 55	0 180	1 904	2 038	14 51	0 162	1 715	1 846	13 90
4284 838	0 179	1 894	2 024	14 62	0 181	1 916	2 050	14 60	0 161	1 704	1 835	13 82
4287 566	0 176	1 862	1 992	14 39	0 180	1 904	2 038	14 51	0 162	1 714	1 845	13 90
4288 310	0 179	1 893	2 023	14 62	0 180	1 903	2 037	14 50	0 163	1 724	1 855	13 97
4289 525	0 178	1 882	2 012	14 54	0 180	1 902	2 036	14 50	0 160	1 693	1 824	13 74
4290 377	0 178	1 882	2 012	14 54	0 179	1 892	2,026	14 43	0 161	1 704	1 835	13 82
4290 542	0 179	1 891	2 021	14 60	0 182	1 922	2 056	14 64	0 163	1 724	1 855	13 97
4291 630	0 179	1 891	2 021	14 60	0 180	1 901	2 035	14 49	0 162	1 712	1 843	13 88

λ	$\phi = 34°8$				$\phi = 50°3$				$\phi = 65°8$				$\phi = 79°3$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 136	1 475	1 594	13 78	0 095	1 030	1 128	12 54	0 057	0 621	0 689	11 93	0 019	0 206	0 245	9 37
4197 257	0 136	1 476	1 595	13 79	0 096	1 039	1 137	12 64	0 058	0 630	0 698	12 09	0 019	0 206	0 245	9 37
4203 730	0 138	1 490	1 609	13 91	0 098	1 062	1 160	12 89	0 058	0 626	0 694	12 02	0 020	0 216	0 255	9 75
4207 566	0 138	1 488	1 607	13 89	0 098	1 061	1 159	12 88	0 058	0 626	0 694	12 02	0 020	0 215	0 254	9 71
4216 136	0 136	1 467	1 586	13 71	0 097	1 044	1 142	12 69	0 058	0 625	0 693	12 00	0 020	0 215	0 254	9 71
4220 509	0 139	1 493	1 612	13 94	0 099	1 065	1 163	12 93	0 058	0 625	0 693	12 00	0 020	0 215	0 254	9 71
4232 887	0 140	1 502	1 621	14 01	0 099	1 063	1 161	12 90	0 058	0 623	0 691	11 97	0 020	0 215	0 254	9 71
4233 328	0 140	1 502	1 621	14 01	0 098	1 052	1 150	12 78	0 056	0 601	0 669	11 59	0 019	0 204	0 243	9 29
4257 815	0 142	1 505	1 624	14 04	0 100	1 067	1 165	12 95	0 060	0 639	0 707	12 24	0 022	0 234	0 273	10 44
4258 477	0 140	1 483	1 602	13 85	0 100	1 066	1 164	12 94	0 060	0 639	0 707	12 24	0 020	0 213	0 252	9 64
4265.418	0 141	1 492	1 611	13 93	0 101	1 071	1 169	12 99	0 059	0 628	0 696	12 05	0 021	0 223	0 262	10 02
4266 081	0 141	1 492	1 611	13 93	0 101	1 071	1 169	12 99	0 060	0 635	0 703	12 18	0 020	0 213	0 252	9 64
4268 915	0 140	1 482	1 601	13 84	0 099	1 053	1 151	12 79	0 060	0 635	0 703	12 18	0 020	0 212	0 251	9 60
4276 836	0 142	1 503	1 622	14 02	0 100	1 059	1 157	12 86	0 060	0 635	0 703	12 18	0 021	0 223	0 262	10 02
4283 169	0 140	1 481	1 600	13 83	0 100	1 059	1 157	12 86	0 057	0 593	0 661	11 45	0 020	0 212	0 251	9 60
4284 838	0 142	1 504	1 623	14 03	0 102	1 079	1 177	13 08	0 059	0 625	0 693	12 00	0 020	0 211	0 250	9 56
4287 566	0 141	1 492	1 611	13 93	0 100	1 058	1 156	12 85	0 060	0 635	0 703	12 18	0 022	0 232	0 271	10 36
4288 310	0 142	1 502	1 621	14 01	0 102	1 078	1 176	13 07	0 059	0 624	0 692	11 98	0 024	0 253	0 292	11 16
4289 525	0 141	1 491	1 610	13 92	0 102	1 078	1 176	13 07	0 059	0 624	0 692	11 98	0 024	0 253	0 292	11 16
4290 377	0 140	1 480	1 599	13 82	0 101	1 067	1 165	12 95	0 058	0 615	0 683	11 83	0 022	0 232	0 271	10 36
4290 542	0 142	1 500	1 619	14 00	0 101	1 067	1 165	12 95	0 059	0 624	0 692	12 98	0 020	0 211	0 250	9 56
4291 630	0 142	1 500	1 619	14 00	0 100	1 057	1 155	12 84	0 062	0 616	0 684	11 85	0 022	0 232	0 271	10 36

TABLE II.—RESULTS FOR INDIVIDUAL PLATES. OBSERVATIONS OF 1908.—Continued

Plate ω 128$_1$ 1908, June 9, 12^h 50^m G M T Measured by L on T Distance from Limb 1 5 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		0 5				
☉	78 7	15 5	15 5	74 5	2 0	1 001
☉−Ω	4 2	30 5	30 5	59 5	1 0	1 000
P	12 1	45 5	45 5	44 5	0 7	1 000
D	0 6	60 5	60 5	29 5	0 6	1 000
Diameter	166 0 mm	75 5	75 5	14 5	0 6	1 000
Factor	1 018	90 5	90 5	−0 5	0 6	1 000

λ	$\phi = -0°5$				$\phi = 14°5$				$\phi = 29°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 174	1 897	2 031	14 42	0 164	1 787	1 917	14 06	0 143	1 560	1 684	13 74
4197 257	0 174	1 896	2 030	14 41	0 162	1 776	1 906	13 98	0 144	1 569	1 693	13 81
4203 730	0 176	1 914	2 048	14 54	0 164	1 778	1 908	13 99	0 144	1 556	1 680	13 70
4207 566	0 177	1 923	2 057	14 61	0 163	1 768	1 898	13 92	0 145	1 565	1 689	13 76
4216 136	0 175	1 896	2 030	14 41	0 162	1 757	1 887	13 84	0 145	1 565	1 689	13 76
4220 509	0 177	1 910	2 044	14 51	0 165	1 782	1 912	14 02	0 144	1 554	1 678	13 70
4232 887	0 177	1 907	2 041	14 49	0 166	1 787	1 917	14 06	0 145	1 564	1 688	13 78
4233 328	0 178	1 918	2 052	14 57	0 166	1 787	1 917	14 06	0 146	1 573	1 697	13 85
4257 815	0 182	1 949	2 083	14 79	0 168	1 795	1 925	14 12	0 148	1 574	1 698	13 85
4258 477	0 181	1 935	2 069	14 69	0 169	1 808	1 938	14 21	0 146	1 554	1 678	13 70
4265 418	0 180	1 923	2 057	14 61	0 167	1 777	1 907	13 98	0 146	1 553	1 677	13 69
4266 081	0 182	1 943	2 077	14 75	0 168	1 787	1 917	14 06	0 147	1 564	1 688	13 78
4268 915	0 181	1 929	2 063	14 65	0 167	1 779	1 909	14 00	0 146	1 553	1 677	13 69
4276 836	0 181	1 928	2 062	14 64	0 167	1 779	1 909	14 00	0 146	1 552	1 676	13 68
4283 169	0 183	1 945	2 079	14 76	0 170	1 810	1 940	14 23	0 147	1 562	1 686	13 75
4284 838	0 182	1 933	2 067	14 68	0 168	1 784	1 914	14 04	0 146	1 550	1 674	13 67
4287 566	0 180	1 912	2 046	14 50	0 169	1 794	1 924	14 11	0 147	1 560	1 684	13 75
4288 310	0 181	1 923	2 057	14 61	0 169	1 794	1 924	14 11	0 148	1 570	1 694	13 83
4289 525	0 182	1 932	2 066	14 67	0 168	1 783	1 913	14 03	0 148	1 570	1 694	13 83
4290 377	0 181	1 921	2 055	14 59	0 170	1 805	1 935	14 19	0 146	1 549	1 673	13 65
4290 542	0 182	1 931	2 065	14 66	0 169	1 793	1 923	14 10	0 151	1 601	1 725	14 08
4291 630	0 182	1 931	2 065	14 66	0 169	1 703	1 923	14 10	0 149	1 581	1 705	13 91

λ	$\phi = 44°5$				$\phi = 59°5$				$\phi = 74°5$			
4196 699	0 105	1 146	1 252	12 46	0 070	0 763	0 845	11 82	0 030	0 327	0 379	10 07
4197 257	0 106	1 155	1 261	12 55	0 068	0 741	0 823	11 51	0 028	0 306	0 358	9 51
4203 730	0 108	1 171	1 277	12 71	0 070	0 762	0 844	11 81	0 030	0 326	0 378	10 04
4207 566	0 108	1 171	1 277	12 71	0 070	0 760	0 842	11 78	0 030	0 326	0 378	10 04
4216 136	0 106	1 149	1 255	12 49	0 068	0 737	0 819	11 45	0 029	0 314	0 366	9 72
4220 509	0 108	1 166	1 272	12 66	0 070	0 758	0 840	11 75	0 030	0 325	0 377	10 02
4232 887	0 108	1 163	1 269	12 62	0 068	0 733	0 815	11 40	0 031	0 334	0 386	10 25
4233 328	0 107	1 153	1 259	12 53	0 068	0 733	0 815	11 40	0 030	0 323	0 375	9 96
4257 815	0 110	1 171	1 277	12 71	0 072	0 770	0 852	11 92	0 031	0 332	0 384	10 20
4258 477	0 108	1 151	1 257	12 51	0 071	0 760	0 842	11 78	0 032	0 342	0 394	10 47
4265 418	0 108	1 151	1 257	12 51	0 069	0 737	0 819	11 45	0 031	0 331	0 383	10 17
4266 081	0 109	1 161	1 267	12 61	0 072	0 755	0 837	11 71	0 031	0 331	0 383	10 17
4268 915	0 107	1 139	1 245	12 39	0 072	0 755	0 837	11 71	0 030	0 320	0 372	9 88
4276 836	0 108	1 148	1 254	12 48	0 070	0 745	0 827	11 57	0 032	0 340	0 392	10 41
4283 169	0 108	1 148	1 254	12 48	0 070	0 745	0 827	11 57	0 031	0 329	0 381	10 12
4284 838	0 109	1 158	1 264	12 58	0 069	0 736	0 818	11 44	0 030	0 319	0 371	9 86
4287 566	0 107	1 139	1 245	12 39	0 070	0 745	0 827	11 57	0 031	0 329	0 381	10 12
4288 310	0 108	1 148	1 254	12 48	0 072	0 765	0 847	11 85	0 030	0 319	0 371	9 86
4289 525	0 108	1 147	1 253	12 47	0 070	0 745	0 827	11 57	0 031	0 329	0 381	10 12
4290 377	0 108	1 147	1 253	12 47	0 069	0 735	0 817	11 43	0 030	0 319	0 371	9 86
4290 542	0 109	1 156	1 262	12 56	0 070	0 745	0 827	11 57	0 032	0 339	0 391	10 39
4291 630	0 109	1 156	1 262	12 56	0 073	0 775	0 857	11 97	0 034	0 361	0 413	10 97

TABLE II —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908—Continued

Plate ω 132 1908, June 10, $8^h 15^m$ G M T Measured by L on T Distance from Limb, 1 4 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		0 6				
O	79 5	10 6	10 6	79 4	3 4	1 002
O−Ω	5 0	25 6	25 6	64 4	1 5	1 000
P	11 7	40 6	40 6	49 4	1 0	1 000
D	0 7	55 6	55 6	34 4	0 8	1 000
Diameter	165 6 mm	70 6	70 6	19 4	0 6	1 000
Factor	1 017	85 6	85 6	4 4	0 6	1 000

λ	$\phi = 4°4$				$\phi = 19°4$				$\phi = 34°4$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 172	1 873	2 007	14 29	0 162	1 764	1 895	14 26	0 135	1 469	1 588	13 66
4197 257	0 172	1 873	2 007	14 29	0 161	1 753	1 884	14 18	0 134	1 459	1 578	13 58
4203 730	0 176	1 912	2 046	14 57	0 163	1 766	1 897	14 28	0 138	1 500	1 619	13 93
4207 566	0 174	1 888	2 022	14 40	0 162	1 755	1 886	14 20	0 138	1 497	1 616	13 91
4216 136	0 174	1 883	2 017	14 36	0 161	1 743	1 874	14 10	0 137	1 485	1 604	13 80
4220 509	0 176	1 903	2 037	14 50	0 164	1 773	1 904	14 34	0 137	1 481	1 600	13 77
4232 887	0 178	1 916	2 050	14 60	0 164	1 765	1 896	14 27	0 136	1 465	1 584	13 63
4233 328	0 178	1 916	2 050	14 60	0 164	1 765	1 896	14 27	0 137	1 475	1 594	13 72
4257 815	0 177	1 893	2 027	14 43	0 167	1 785	1 916	14 42	0 138	1 476	1 595	13 73
4258 477	0 179	1 912	2 046	14 57	0 166	1 775	1 906	14 34	0 138	1 473	1 592	13 70
4265 418	0 179	1 910	2 044	14 56	0 166	1 770	1 901	14 31	0 138	1 468	1 587	13 66
4266 081	0 180	1 920	2 054	14 63	0 166	1 770	1 901	14 31	0 140	1 493	1 612	13 87
4268 915	0 180	1 912	2 046	14 57	0 165	1 760	1 891	14 23	0 138	1 467	1 586	13 65
4276 836	0 180	1 912	2 046	14 57	0 167	1 774	1 905	14 35	0 138	1 466	1 585	13 63
4283 169	0 179	1 900	2 034	14 48	0 167	1 773	1 904	14 34	0 139	1 476	1 595	13 73
4284 838	0 178	1 890	2 024	14 41	0 166	1 762	1 893	14 25	0 139	1 475	1 594	13 72
4287 566	0 177	1 878	2 012	14 32	0 167	1 771	1 902	14 32	0 138	1 464	1 583	13 62
4288 310	0 178	1 888	2 022	14 40	0 165	1 750	1 881	14 17	0 139	1 475	1 594	13 72
4289 525	0 180	1 908	2 042	14 55	0 167	1 772	1 903	14 33	0 137	1 453	1 572	13 53
4290 377	0 178	1 887	2 021	14 39	0 167	1 770	1 901	14 31	0 139	1 475	1 594	13 72
4290 542	0 180	1 908	2 042	14 55	0 167	1 770	1 901	14 31	0 142	1 505	1 624	13 98
4291 630	0 177	1 876	2 010	14 31	0 168	1 780	1 911	14 38	0 141	1 495	1 614	13 89

λ	$\phi = 49°4$				$\phi = 64°4$				$\phi = 79°4$			
4196 699	0 097	1 056	1 155	12 60	0 060	0 651	0 723	11 88	0 020	0 218	0 258	9 96
4197 257	0 097	1 056	1 155	12 60	0 058	0 631	0 703	11 56	0 020	0 218	0 258	9 96
4203 730	0 100	1 086	1 185	12 93	0 060	0 651	0 723	11 88	0 020	0 217	0 257	9 92
4207 566	0 098	1 062	1 161	12 67	0 060	0 650	0 722	11 87	0 020	0 217	0 257	9 92
4216 136	0 098	1 061	1 160	12 66	0 060	0 649	0 721	11 84	0 019	0 208	0 248	9 57
4220 509	0 099	1 068	1 167	12 73	0 058	0 627	0 699	11 50	0 020	0 217	0 257	9 92
4232 887	0 100	1 076	1 175	12 82	0 060	0 646	0 718	11 80	0 020	0 216	0 256	9 88
4233 328	0 100	1 076	1 175	12 82	0 060	0 646	0 718	11 80	0 021	0 226	0 266	10 27
4257 815	0 099	1 056	1 155	12 60	0 061	0 652	0 724	11 90	0 022	0 234	0 274	10 57
4258 477	0 099	1 056	1 155	12 60	0 060	0 638	0 710	11 68	0 021	0 224	0 264	10,19
4265 418	0 100	1 063	1 162	12 68	0 060	0 638	0 710	11 68	0 020	0 214	0 254	9 80
4266 081	0 101	1 073	1 172	12 79	0 059	0 630	0 702	11 54	0 022	0 234	0 274	10 57
4268 915	0 101	1 073	1 172	12 79	0 062	0 659	0 731	12 02	0 022	0 234	0 274	10 57
4276 836	0 099	1 054	1 153	12 58	0 060	0 638	0 710	11 68	0 021	0 224	0 264	10 19
4283 169	0 100	1 062	1 181	12 89	0 060	0 638	0 710	11 68	0 021	0 224	0 264	10 19
4284 838	0 102	1 083	1 182	12 90	0 060	0 638	0 710	11 68	0 021	0 224	0 264	10 19
4287 566	0 100	1 061	1 160	12 66	0 060	0 638	0 710	11 68	0 022	0 234	0 274	10 57
4288 310	0 102	1 083	1 182	12 90	0 061	0 648	0 720	11 83	0 021	0 224	0 264	10 19
4289 525	0 103	1 093	1 192	13 00	0 062	0 657	0 729	11 98	0 020	0 214	0 254	9 80
4290 377	0 100	1 060	1 159	12 65	0 060	0 637	0 709	11 66	0 020	0 214	0 254	9 80
4290 542	0 101	1 070	1 169	12 76	0 060	0 637	0 709	11 66	0 021	0 223	0 263	10 15
4291 630	0 102	1 081	1 180	12 88	0 061	0 647	0 719	11 82	0 022	0 233	0 273	10 54

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 134 1908, June 11, $3^h\ 0^m$ G M T Measured by L on T Distance from Limb 2 5 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		0 5				
O	80 2	10 5	10 5	79 5	4 0	1 002
O−Ω	5 7	25 5	25 5	64 5	1 7	1 000
P	11 4	40 5	40 5	49 5	1 1	1 000
D	0 8	55 5	55 5	34 5	0 9	1 000
Diameter	168 0 mm	70 5	70 5	19 5	0 7	1 000
Factor	1 031	85 5	85 5	4 5	0 7	1 000
		90 5	90 5	−0 5	0 7	1 000

λ	$\phi = -0°5$				$\phi = 4°5$				$\phi = 19°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 171	1 888	2 022	14 36	0 169	1 864	1 998	14 23	0 156	1 721	1 852	13 95
4197 257	0 172	1 897	2 031	14 42	0 169	1 864	1 998	14 23	0 156	1 721	1 852	13 95
4203 730	0 174	1 914	2 048	14 54	0 170	1 870	2 004	14 27	0 157	1 727	1 858	13 99
4207 566	0 173	1 900	2 034	14 45	0 173	1 902	2 036	14 50	0 158	1 737	1 868	14 07
4216 136	0 174	1 907	2 041	14 49	0 169	1 855	1 989	14 16	0 156	1 711	1 842	13 87
4220 509	0 174	1 905	2 039	14 48	0 172	1 883	2 017	14 36	0 160	1 752	1 883	14 18
4232 887	0 176	1 918	2 052	14 57	0 174	1 905	2 039	14 52	0 160	1 745	1 876	14 13
4233 328	0 175	1 908	2 042	14 50	0 174	1 905	2 039	14 52	0 161	1 756	1 887	14 21
4257 815	0 178	1 929	2 063	14 65	0 173	1 875	2 009	14 31	0 161	1 745	1 876	14 13
4258 477	0 177	1 914	2 048	14 54	0 174	1 885	2 019	14 38	0 160	1 735	1 866	14 05
4265 418	0 177	1 912	2 046	14 53	0 175	1 891	2 025	14 42	0 160	1 731	1 862	14 02
4266 081	0 178	1 918	2 052	14 57	0 175	1 891	2 025	14 42	0 160	1 731	1 862	14 02
4268 915	0 178	1 926	2 060	14 63	0 175	1 889	2 023	14 41	0 160	1 730	1 861	14 01
4276 836	0 179	1 916	2 050	14 55	0 174	1 875	2 009	14 31	0 161	1 737	1 868	14 06
4283 169	0 178	1 914	2 048	14 54	0 174	1 871	2 005	14 28	0 158	1 699	1 830	13 78
4284 838	0 180	1 932	2 066	14 67	0 175	1 880	2 014	14 34	0 160	1 721	1 852	13 95
4287 566	0 178	1 912	2 046	14 53	0 175	1 880	2 014	14 34	0 160	1 721	1 852	13 95
4288 310	0 177	1 903	2 037	14 47	0 174	1 870	2 004	14 27	0 159	1 709	1 840	13 86
4289 525	0 177	1 902	2 036	14 46	0 175	1 880	2 014	14 34	0 161	1 731	1 862	14 02
4290 377	0 177	1 902	2 036	14 46	0 171	1 869	2 003	14 26	0 159	1 708	1 839	13 85
4290 542	0 177	1 902	2 036	14 46	0 173	1 858	1 992	14 19	0 162	1 739	1 870	14 08
4291 630	0 176	1 891	2 025	14 38	0 175	1 878	2 012	14 33	0 161	1 728	1 859	14 00

λ	$\phi = 34°5$				$\phi = 49°5$				$\phi = 64°5$				$\phi = 79°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 130	1 435	1 555	13 40	0 096	1 058	1 157	12 65	0 057	0 629	0 701	11 56	0 019	0 210	0 250	9 74
4197 257	0 131	1 445	1 665	13 48	0 096	1 058	1 157	12 65	0 058	0 619	0 691	11 40	0 022	0 242	0 282	10 99
4203 730	0 132	1 453	1 573	13 55	0 096	1 056	1 155	12 63	0 057	0 627	0 699	11 51	0 020	0 220	0 260	10 13
4207 566	0 130	1 430	1 550	13 35	0 097	1 066	1 165	12 74	0 058	0 638	0 710	11 72	0 020	0 220	0 260	10 13
4216 136	0 132	1 446	1 566	13 49	0 097	1 063	1 162	12 70	0 057	0 625	0 697	11 50	0 019	0 209	0 249	9 70
4220 509	0 131	1 435	1 555	13 40	0 100	1 096	1 195	13 06	0 058	0 634	0 706	11 64	0 020	0 219	0 259	10 09
4232 887	0 132	1 440	1 560	13 44	0 098	1 068	1 167	12 76	0 058	0 633	0 705	11 62	0 019	0 208	0 248	9 66
4233 328	0 132	1 440	1 560	13 44	0 098	1 068	1 167	12 76	0 058	0 633	0 705	11 62	0 019	0 208	0 248	9 66
4257 815	0 133	1 443	1 563	13 47	0 100	1 085	1 184	12 94	0 059	0 639	0 711	11 73	0 020	0 217	0 257	10 01
4258 477	0 133	1 441	1 561	13 45	0 099	1 071	1 170	12 80	0 059	0 639	0 711	11 73	0 021	0 227	0 267	10 40
4265 418	0 132	1 428	1 548	13 34	0 099	1 071	1 170	12 80	0 060	0 649	0 721	11 89	0 022	0 237	0 277	10 79
4266 081	0 134	1 448	1 568	13 51	0 098	1 059	1 158	12 66	0 060	0 649	0 721	11 89	0 022	0 237	0 277	10 79
4268 915	0 132	1 425	1 545	13 31	0 098	1 056	1 155	12 63	0 060	0 649	0 721	11 89	0 020	0 216	0 256	9 97
4276 836	0 131	1 412	1 532	13 20	0 100	1 077	1 176	12 85	0 059	0 637	0 709	11 70	0 022	0 237	0 277	10 79
4283 169	0 133	1 431	1 551	13 36	0 098	1 055	1 154	12 62	0 059	0 636	0 708	11 69	0 020	0 216	0 256	9 97
4284 838	0 134	1 443	1 563	13 47	0 098	1 055	1 154	12 62	0 060	0 646	0 718	11 84	0 020	0 215	0 255	9 93
4287 566	0 133	1 430	1 550	13 35	0 100	1 074	1 173	12 82	0 058	0 624	0 696	11 48	0 021	0 226	0 266	10 36
4288 310	0 133	1 430	1 550	13 35	0 098	1 055	1 154	12 62	0 058	0 624	0 696	11 48	0 022	0 236	0 276	10 75
4289 525	0 134	1 440	1 560	13 44	0 100	1 073	1 172	12 81	0 060	0 644	0 716	11 81	0 021	0 226	0 266	10 36
4290 377	0 134	1 439	1 559	13 43	0 098	1 053	1 152	12 60	0 059	0 634	0 706	11 64	0 020	0 215	0 255	9 93
4290 542	0 134	1 439	1 559	13 43	0 098	1 052	1 151	12 59	0 058	0 623	0 695	11 46	0 022	0 236	0 276	10 75
4291 630	0 135	1 449	1 569	13 52	0 101	1 084	1 183	12 93	0 060	0 644	0 716	11 81	0 020	0 215	0 255	9 93

TABLE II —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908—Continued

Plate ω 135_1 1908, June 11, 4^h 50^m G M T Measured by L on T Distance from Limb 2 1 mm Quality, good

	°	$p-P$	π	ϕ	η	sec η
		°	°	°	°	
		0 5				
O	80 2	10 5	10 5	79 5	4 0	1 002
O−Ω	5 7	15 5	15 5	74 5	2 7	1 001
P	11 4	20 5	30 5	59 5	1 4	1 000
D	0 8	45 5	45 5	44 5	1 0	1 000
Diameter	167 4 mm	60 5	60 5	29 5	0 8	1 000
Factor	1 026	75 5	75 5	14 5	0 7	1 000
		90 5	90 5	−0 5	0 7	1 000

λ	$\phi = -0°5$				$\phi = 14°5$				$\phi = 29°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 173	1 899	2 033	14 44	0 162	1 779	1 912	14 02	0 141	1 547	1 672	13 64
4197 257	0 174	1 910	2 044	14 52	0 160	1 756	1 889	13 35	0 140	1 537	1 662	13 56
4203 730	0 174	1 908	2 042	14 50	0 164	1 796	1 929	14 15	0 143	1 565	1 690	13 79
4207 566	0 174	1 904	2 038	14 47	0 164	1 793	1 926	14 12	0 143	1 565	1 690	13 79
4216 136	0 177	1 931	2 065	14 66	0 164	1 790	1 923	14 10	0 141	1 539	1 664	13 57
4220 509	0 176	1 918	2 052	14 57	0 166	1 809	1 942	14 24	0 143	1 554	1 679	13 70
4232 887	0 178	1 933	2 067	14 67	0 164	1 791	1 924	14 11	0 142	1 542	1 667	13 60
4233 328	0 179	1 942	2 076	14 74	0 168	1 824	1 957	14 35	0 142	1 542	1 667	13 60
4257 815	0 180	1 938	2 072	14 71	0 169	1 823	1 956	14 34	0 142	1 540	1 665	13 58
4258 477	0 180	1 936	2 070	14 70	0 170	1 831	1 964	14 40	0 145	1 564	1 689	13 78
4265 418	0 178	1 915	2 049	14 55	0 170	1 829	1 962	14 39	0 142	1 529	1 654	13 49
4266 081	0 182	1 963	2 097	14 90	0 168	1 807	1 940	14 23	0 146	1 570	1 695	13 83
4268 915	0 182	1 953	2 087	14 83	0 170	1 820	1 953	14 32	0 143	1 539	1 664	13 57
4276 836	0 180	1 928	2 062	14 64	0 169	1 809	1 942	14 24	0 144	1 545	1 670	13 62
4283 169	0 182	1 949	2 083	14 79	0 168	1 798	1 931	14 16	0 146	1 562	1 687	13 76
4284 838	0 180	1 926	2 060	14 63	0 170	1 818	1 951	14 31	0 147	1 573	1 698	13 85
4287 566	0 181	1 935	2 069	14 69	0 171	1 829	1 962	14 39	0 144	1 542	1 667	13 60
4288 310	0 180	1 925	2 059	14 62	0 170	1 817	1 950	14 30	0 146	1 561	1 686	13 75
4289 525	0 180	1 924	2 058	14 61	0 170	1 820	1 953	14 32	0 145	1 551	1 676	13 67
4290 377	0 180	1 924	2 058	14 61	0 168	1 797	1 930	14 15	0 144	1 540	1 665	13 58
4290 542	0 180	1 924	2 058	14 61	0 170	1 817	1 950	14 30	0 146	1 553	1 678	13 69
4291 630	0 180	1 923	2 057	14 60	0 169	1.806	1 939	14 22	0 146	1 553	1 678	13 69

λ	$\phi = 44°5$				$\phi = 59°5$				$\phi = 74°5$				$\phi = 79°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 102	1 122	1 228	12 22	0 060	0 667	0 748	10 46	0 029	0 319	0 370	9 83	0 020	0 220	0 260	10 13
4197 257	0 103	1 130	1 236	12 30	0 062	0 681	0 762	10 66	0 028	0 309	0 360	9 56	0 020	0 220	0 260	10 13
4203 730	0 104	1 138	1 244	12 38	0 064	0 700	0 781	10 92	0 030	0 329	0 380	10 10	0 021	0 229	0 269	10 48
4207 566	0 104	1 136	1 242	12 36	0 063	0 690	0 771	10 78	0 029	0 318	0 369	9 80	0 021	0 219	0 259	10 09
4216 136	0 104	1 134	1 240	12 34	0 063	0 690	0 771	10 78	0 030	0 327	0 378	10 05	0 019	0 208	0 248	9 66
4220 509	0 106	1 156	1 262	12 56	0 063	0 688	0 769	10 75	0 031	0 337	0 388	10 31	0 020	0 218	0 258	10 05
4232 887	0 106	1 151	1 257	12 51	0 064	0 695	0 776	10 85	0 030	0 326	0 377	10 02	0 020	0 218	0 258	10 05
4233 328	0 106	1 151	1 257	12 51	0 064	0 695	0 776	10 85	0 030	0 326	0 377	10 02	0 021	0 228	0 268	10.44
4257 815	0 105	1 132	1 238	12 32	0 063	0 679	0 760	10 63	0 032	0 344	0 395	10 49	0 021	0 227	0 267	10 40
4258 477	0 108	1 162	1 268	12 62	0 064	0 689	0 770	10 77	0 030	0 324	0 375	9 97	0 020	0 216	0 256	9 97
4265 418	0 105	1 129	1 235	12 29	0 063	0 678	0 758	10 60	0 032	0 344	0 395	10 49	0 022	0 236	0 276	10 75
4266 081	0 107	1 151	1 257	12 51	0 064	0 687	0 768	10 74	0 030	0 324	0 375	9 97	0 020	0 215	0 255	9 93
4268 915	0 108	1 161	1 267	12 61	0 064	0 687	0 768	10 74	0 032	0 344	0 395	10 49	0 022	0 235	0 275	10 71
4276 836	0 106	1 136	1 242	12 36	0 064	0 687	0 768	10 74	0 031	0 334	0 385	10 23	0 021	0 225	0 265	10 32
4283 169	0 106	1 134	1 240	12 34	0 066	0 707	0 788	11 02	0 030	0 322	0 373	9 91	0 022	0 235	0 275	10 71
4284 838	0 106	1 134	1 240	12 34	0 064	0 687	0 768	10 74	0 032	0 344	0 395	10 49	0 021	0 224	0 264	10 28
4287 566	0 107	1 144	1 250	12 44	0 064	0 687	0 768	10 74	0 031	0 334	0 385	10 23	0 021	0 224	0 264	10 28
4288 310	0 106	1 133	1 239	12 33	0 066	0 707	0 788	11 02	0 032	0 343	0 394	10 46	0 021	0 224	0 264	10 28
4289 525	0 108	1 154	1 260	12 54	0 066	0 707	0 788	11 02	0 030	0 321	0 372	9 88	0 020	0 213	0 253	9 85
4290 377	0 105	1 123	1 229	12 23	0 064	0 687	0 768	10 74	0 030	0 321	0 372	9 88	0 020	0 213	0 253	9 85
4290 542	0 104	1 113	1 219	12 13	0 066	0 705	0 786	10 99	0 032	0 342	0 393	10 43	0 020	0 213	0 253	9.85
4291 630	0 106	1 132	1 238	12 32	0 066	0 705	0 786	10.99	0 030	0 321	0 372	9 88	0 022	0 234	0 274	10 69

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 1352_2 1908, June 11, 4^h 50^m G M T Measured by L on T Distance from Limb 1 8 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		0 5				
O	80 2	10 5	10 5	79 5	4 0	1 002
O−Ω	5 7	15 5	15 5	74 5	2 7	1 001
P	11 4	30 5	30 5	59 5	1 4	1 000
D	0 8	45 5	45 5	44 5	1 0	1 000
Diameter	167 4 mm	60 5	60 5	29 5	0 8	1 000
Factor	1 022	75 5	75 5	14 5	0 7	1 000
		90 5	90 5	−0 5	0 7	1 000

λ	$\phi = -0°5$				$\phi = 14°5$				$\phi = 29°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 171	1 872	2 006	14 24	0 161	1 762	1 895	13 90	0 141	1 542	1 667	13 60
4197 257	0 172	1 881	2 015	14 31	0 162	1 771	1 904	13 96	0 140	1 533	1 658	13 52
4203 730	0 172	1 880	2 014	14 30	0 164	1 789	1 922	14 09	0 141	1 539	1 664	13 57
4207 566	0 172	1 875	2 009	14 26	0 164	1 783	1 916	14 06	0 143	1 560	1 685	13 75
4216 136	0 172	1 870	2 004	14 22	0 163	1 772	1 905	13 97	0 141	1 533	1 658	13 52
4220 509	0 175	1 900	2 034	14 43	0 164	1 781	1 914	14 04	0 143	1 553	1 678	13 69
4232 887	0 176	1 902	2 036	14 45	0 165	1 784	1 917	14 06	0 145	1 569	1 694	13 82
4233 328	0 174	1 881	2 015	14 31	0 165	1 784	1 917	14 06	0 146	1 579	1 704	13 90
4257 815	0 179	1 923	2 057	14 60	0 170	1 827	1 960	14 37	0 146	1 566	1 691	13 79
4258 477	0 179	1 921	2 055	14 59	0 169	1 814	1 947	14 28	0 145	1 553	1 678	13 69
4265 418	0 178	1 908	2 042	14 50	0 170	1 824	1 957	14 35	0 146	1 563	1 688	13 77
4266 081	0 181	1 940	2 074	14 72	0 170	1 822	1 955	14 34	0 146	1 563	1 688	13 77
4268 915	0 179	1 913	2 047	14 54	0 171	1 825	1 958	14 36	0 146	1 561	1 686	13 76
4276 836	0 179	1 911	2 045	14 53	0 170	1 814	1 947	14 28	0 145	1 550	1 675	13 66
4283 169	0 180	1 919	2 053	14 57	0 170	1 813	1 946	14 26	0 147	1 569	1 694	13 82
4284 838	0 179	1 911	2 045	14 52	0 168	1 791	1 924	14 11	0 145	1 546	1 671	13 63
4287 566	0 181	1 928	2 062	14 64	0 171	1 822	1 955	14 34	0 147	1 568	1 693	13 81
4288 310	0 179	1 901	2 035	14 46	0 171	1 822	1 955	14 34	0 148	1 577	1 702	13 88
4289 525	0 178	1 895	2 029	14 39	0 173	1 843	1 976	14 49	0 146	1 555	1 680	13 71
4290 377	0 180	1 917	2 051	14 56	0 170	1 811	1 944	14 26	0 146	1 555	1 680	13 71
4290 542	0 180	1 916	2 050	14 54	0 171	1 821	1 954	14 33	0 146	1 554	1 679	13 70
4291 630	0 180	1 916	2 050	14 54	0 172	1 831	1 964	14 40	0 146	1 554	1 679	13 70

λ	$\phi = 44°5$				$\phi = 59°5$				$\phi = 74°5$				$\phi = 79°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 102	1 116	1 222	12 16	0 060	0 659	0 740	10 35	0 030	0 329	0 380	10 10	0 019	0 209	0 249	9 70
4197 257	0 102	1 116	1 222	12 16	0 060	0 659	0 740	10 35	0 029	0 319	0 370	9 83	0 019	0 209	0 249	9 70
4203 730	0 103	1 124	1 230	12 24	0 062	0 682	0 763	10 67	0 031	0 329	0 380	10 10	0 019	0 209	0 249	9 70
4207 566	0 104	1 134	1 240	12 34	0 062	0 681	0 762	10 66	0 029	0 319	0 370	9 83	0 020	0 218	0 258	10 05
4216 136	0 104	1 132	1 238	12 32	0 061	0 669	0 750	10 49	0 029	0 318	0 369	9 80	0 019	0 207	0 247	9 62
4220 509	0 104	1 129	1 234	12 28	0 062	0 677	0 758	10 60	0 030	0 329	0 380	10 10	0 020	0 217	0 257	10 01
4232 887	0 106	1 146	1 252	12 46	0 062	0 674	0 755	10 56	0 030	0 326	0 377	10 02	0 019	0 206	0 246	9 58
4233 328	0 105	1 135	1 241	12 35	0 063	0 684	0 765	10 70	0 030	0 326	0 377	10 02	0 020	0 216	0 256	9 97
4257 815	0 108	1 161	1 267	12 61	0 065	0 703	0 784	10 96	0 032	0 346	0 397	10 55	0 022	0 236	0 276	10 75
4258 477	0 106	1 136	1 242	12 36	0 064	0 690	0 771	10 78	0 031	0 336	0 387	10 28	0 019	0 205	0 245	9 54
4265 418	0 104	1 115	1 221	12 15	0 063	0 679	0 760	10 63	0 032	0 345	0 396	10 52	0 020	0 215	0 255	9 93
4266 081	0 107	1 144	1 250	12 44	0 065	0 702	0 783	10 97	0 031	0 334	0 385	10 23	0 022	0 235	0 275	10 71
4268 915	0 108	1 154	1 260	12 54	0 066	0 710	0 791	11 06	0 032	0 344	0 395	10 49	0 021	0 225	0 265	10 32
4276 836	0 106	1 134	1 240	12 34	0 066	0 708	0 789	11 03	0 032	0 343	0 394	10 47	0 021	0 225	0 265	10 32
4283 169	0 108	1 152	1 258	12 52	0 066	0 707	0 788	11 02	0 031	0 333	0 384	10 20	0 020	0 215	0 255	9 93
4284 838	0 106	1 132	1 238	12 32	0 065	0 696	0 777	10 87	0 031	0 333	0 384	10 20	0 021	0 225	0 265	10 32
4287 566	0 108	1 151	1 257	12 51	0 065	0 696	0 777	10 87	0 032	0 343	0 394	10 47	0 021	0 225	0 265	10 32
4288 310	0 107	1 140	1 246	12 40	0 064	0 685	0 766	10 71	0 031	0 333	0 384	10 20	0 020	0 215	0 255	9 93
4289 525	0 106	1 129	1 235	12 29	0 066	0 706	0 787	11 01	0 031	0 333	0 384	10 20	0 022	0 245	0 285	11 10
4290 377	0 104	1 107	1 213	12 07	0 065	0 695	0 776	10 86	0 031	0 332	0 383	10 18	0 021	0 225	0 265	10 32
4290 542	0 104	1 107	1 213	12 07	0 067	0 716	0 797	11 15	0 032	0 342	0 393	10 44	0 021	0 225	0 265	10 32
4291.630	0 103	1 097	1 203	11 97	0 067	0 716	0 797	11 15	0 032	0 342	0 393	10 44	0 022	0 229	0 269	10 48

TABLE II —RESULTS FOR INDIVIDUAL PLATES   OBSERVATIONS OF 1908 — Continued

Plate ω 136   1908, June 11, $5^h\ 40^m$ G M T   Measured by L on T   Distance from Limb 1 8 mm   Quality, good

	°	$p-P$ °	π °	ϕ °	η °	sec η
		0 5				
O	80 3	10 5	10 5	79 5	4 0	1 002
O−Ω	5 8	25 5	25 5	64 5	2 7	1 000
P	11 4	40 5	40 5	49 5	1 4	1 000
D	0 8	55 5	55 5	34 5	1 0	1 000
Diameter	167 0 mm	70 5	70 5	19 5	0 8	1 000
Factor	1 022	85 5	85 5	4 5	0 7	1 000
		90 5	90 5	−0 5	0 7	1 000

λ	$\phi = -0°5$				$\phi = 4°5$				$\phi = 19°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 172	1 882	2 016	14 31	0 166	1 819	1 953	13 91	0 156	1 707	1 838	13 84
4197 257	0 172	1 882	2 016	14 31	0 167	1 826	1 960	13 96	0 156	1 707	1 838	13 84
4203 730	0 174	1 899	2 033	14 42	0 166	1 814	1 948	13 87	0 156	1 703	1 834	13 81
4207 566	0 174	1 896	2 030	14 40	0 167	1 821	1 955	13 92	0 158	1 723	1 854	13 97
4216 136	0 173	1 882	2 016	14 31	0 169	1 839	1 973	14 06	0 157	1 703	1 834	13 82
4220 509	0 175	1 896	2 030	14 40	0 171	1 854	1 988	14 16	0 156	1 692	1 823	13 73
4232 887	0 175	1 903	2 037	14 46	0 171	1 851	1 985	14 14	0 158	1 709	1 840	13 86
4233 328	0 176	1 903	2 037	14 46	0 173	1 870	2 004	14 27	0 158	1 709	1 840	13 86
4257 815	0 180	1 935	2 069	14 69	0 174	1 871	2 005	14 28	0 161	1 727	1 858	13 99
4258 477	0 180	1 932	2 066	14 66	0 176	1 891	2 025	14 42	0 160	1 715	1 846	13 90
4265 418	0 180	1 930	2 064	14 65	0 174	1 858	1 992	14 19	0 160	1 712	1 843	13 88
4266 081	0 180	1 927	2 061	14 63	0 174	1 856	1 990	14 17	0 161	1 722	1 853	13 96
4268 915	0 180	1 924	2 058	14 60	0 175	1 865	1 999	14 24	0 159	1 702	1 833	13 81
4276 836	0 180	1 922	2 056	14 59	0 173	1 845	1 979	14 10	0 162	1 729	1 860	14 01
4283 169	0 179	1 911	2 045	14 52	0 172	1 834	1 968	14 02	0 162	1 728	1 858	13 99
4284 838	0 183	1 951	2 085	14 80	0 175	1 864	1 998	14 23	0 161	1 717	1 848	13 92
4287 566	0 179	1 908	2 042	14 50	0 172	1 834	1 968	14 02	0 160	1 707	1 838	13 84
4288 310	0 180	1 917	2 051	14 56	0 172	1 832	1 966	14 01	0 163	1 737	1 868	14 07
4289 525	0 178	1 896	2 030	14 40	0 173	1 844	1 978	14 09	0 162	1 727	1 858	13 99
4290 377	0 180	1 917	2 051	14 56	0 173	1 844	1 978	14 09	0 162	1 727	1 858	13.99
4290 542	0 182	1 937	2 071	14 70	0 174	1 852	1 986	14 15	0 162	1 727	1 858	13 99
4291 630	0 181	1 927	2 061	14 63	0 174	1 852	1 986	14 15	0 163	1.735	1 864	14 04

λ	$\phi = 34°5$				$\phi = 49°5$				$\phi = 64°5$				$\phi = 79°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 128	1 400	1 520	13 09	0 094	1 028	1 127	12 32	0 052	1 569	0 641	10 57	0 022	0.240	0 280	10 91
4197 257	0 128	1 400	1 520	13 09	0 094	1 028	1 127	12 32	0 052	1 569	0 641	10.57	0 020	0 220	0 260	10 12
4203 730	0 130	1 420	1 540	13 27	0 098	1 065	1 164	12 72	0 052	1 567	0 639	10 54	0 020	0 219	0 259	10 10
4207 566	0 130	1 417	1 537	13 24	0 101	1 102	1 201	13 13	0 054	1 590	0 662	10 92	0 021	0 029	0 269	10 48
4216 136	0 128	1 392	1 512	13 03	0 097	1 052	1 151	12 58	0 051	1 555	0 627	10 34	0 020	0 219	0 259	10 10
4220 509	0 132	1 431	1 551	13 36	0 099	1 070	1 169	12 78	0 054	1 588	0 660	10 88	0 021	0 228	0 268	10 44
4232 887	0 132	1 428	1 548	13 34	0 097	1 048	1 147	12 54	0 054	1 585	0 657	10 83	0 020	0 218	0 258	10 06
4233 328	0 132	1 428	1 548	13 34	0 097	1 048	1 147	12 54	0 053	1 574	0 646	10 65	0 020	0 218	0 258	10 06
4257 815	0 134	1 440	1 560	13 44	0 100	1 074	1 173	12 82	0 054	1 580	0 652	10 76	0 022	0 236	0 276	10 75
4258 477	0 134	1 439	1 559	13 43	0 098	1 052	1 151	12 58	0 054	1 579	0 651	10 74	0 020	0 216	0.256	9 97
4265 418	0 134	1 437	1 557	13 41	0 099	1 061	1 160	12 68	0 055	1 589	0 661	10 90	0 022	0 236	0 276	10 75
4266 081	0 134	1 435	1 555	13 40	0 101	1 081	1 180	12 90	0 054	1 579	0 651	10 74	0 022	0 236	0 276	10 75
4268 915	0 135	1 441	1 561	13 45	0 100	1 070	1 169	12 78	0 055	1 589	0 661	10 90	0.022	0 236	0 276	10 75
4276 836	0 135	1 441	1 561	13 45	0 100	1 068	1 167	12 76	0 056	1 599	0 671	11 07	0 020	0 216	0 256	9 97
4283 169	0 134	1 431	1 551	13 36	0 100	1 066	1 165	12 74	0 056	1 596	0 668	11 02	0 022	0 236	0 276	10 75
4284 838	0 135	1 446	1 566	13 49	0 099	1 057	1 156	12 64	0 056	1 596	0 668	11 02	0 020	0 214	0 254	9 90
4287 566	0 134	1 431	1 551	13 36	0 098	1 046	1 145	12 52	0 056	1 595	0 667	11 00	0 021	0 225	0 265	10 32
4288 310	0 136	1 449	1 569	13 52	0 100	1 065	1 164	12 72	0 053	1 564	0 636	10 48	0 022	0 235	0 275	10 71
4289 525	0 135	1 441	1 561	13 45	0 100	1 064	1 163	12 71	0 055	1 607	0 679	11 20	0 021	0 225	0 265	10 32
4290 377	0 134	1 431	1 551	13 36	0 099	1 054	1 153	12 60	0 056	1 597	0 669	11 04	0 020	0 214	0 254	9 90
4290 542	0 136	1 448	1 568	13 51	0 098	1 044	1 143	12 49	0 056	1 597	0 669	11 04	0 020	0 214	0 254	9.90
4291 630	0 136	1 449	1 569	13 52	0 099	1 053	1 152	12 59	0 058	1 607	0 679	11 20	0 022	0 235	0 275	10 71

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 146 1908, Aug 5, $9^h 50^m$ G M T Measured by L on T Distance from Limb 1 3 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		−0 3				
O	133 0	13 2	14 6	75 4	25 3	1 106
O−Ω	58 5	28 7	29 3	60 7	12 7	1 025
P	−12 7	44 2	44 5	45 5	8 8	1 012
D	6 2	59 7	59 9	30 1	7 2	1 008
Diameter	168 6 mm	74 7	74 8	15 2	6 4	1 006
Factor	1 016	89 7	89 7	0 3	6 2	1 006

λ	$\phi = 0°3$				$\phi = 15°2$				$\phi = 30°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 171	1 872	2 006	14 24	0 164	1 794	1 926	14 17	0 139	1 525	1 646	13 51
4197 257	0 172	1 881	2 015	14 31	0 165	1 804	1 936	14 24	0 140	1 533	1 654	13 57
4203 730	0 173	1 887	2 021	14 35	0 166	1 810	1 942	14 29	0 140	1 530	1 651	13 55
4207 566	0 170	1 854	1 988	14 11	0 165	1 798	1 930	14 20	0 142	1 551	1 672	13 72
4216 136	0 172	1 870	2 004	14 23	0 165	1 794	1 926	14 17	0 141	1 535	1 656	13 59
4220 509	0 173	1 879	2 013	14 29	0 166	1 802	1 934	14 23	0 140	1 523	1 644	13 49
4232 887	0 176	1 904	2 038	14 47	0 167	1 805	1 937	14 25	0 141	1 529	1 650	13 54
4233 328	0 177	1 914	2 048	14 54	0 167	1 805	1 937	14 25	0 142	1 538	1 659	13 61
4257 815	0 178	1 913	2 047	14 53	0 169	1 815	1 947	14 32	0 144	1 546	1 667	13 68
4258 477	0 177	1 902	2 036	14 45	0 167	1 791	1 923	14 15	0 143	1 536	1 657	13 60
4265 418	0 178	1 901	2 035	14 45	0 168	1 800	1 932	14 21	0 143	1 536	1 657	13 60
4266 081	0 179	1 918	2 052	14 57	0 170	1 819	1 951	14 35	0 143	1 536	1 657	13 60
4268 915	0 180	1 927	2 061	14 63	0 168	1 799	1 931	14 21	0 143	1 535	1 656	13 59
4276 836	0 178	1 898	2 032	14 42	0 168	1 794	1 926	14 17	0 144	1 538	1 659	13 61
4283 169	0 178	1 897	2 031	14 42	0 170	1 812	1 944	14 30	0 144	1 538	1 659	13 61
4284 838	0 179	1 907	2 041	14 49	0 168	1 792	1 924	14 15	0 143	1 527	1 648	13 52
4287 566	0 177	1 886	2 020	14 34	0 170	1 812	1 944	14 30	0 143	1 526	1 647	13 52
4288 310	0 178	1 895	2 029	14 40	0 168	1 790	1 922	14 14	0 147	1 570	1 691	13 88
4289 525	0 177	1 885	2 019	14 33	0 170	1 810	1 942	14 29	0 143	1 530	1 651	13 55
4290 377	0 178	1 896	2 030	14 41	0 171	1 820	1 952	14 36	0 143	1 528	1 649	13 53
4290 542	0 179	1 905	2 039	14 48	0 169	1 798	1 930	14 20	0 144	1 537	1 658	13 61
4291 630	0 178	1 894	2 028	14 40	0 168	1 790	1 922	14 14	0 146	1 557	1 678	13 77

λ	$\phi = 45°5$				$\phi = 60°7$				$\phi = 75°4$			
4196 699	0 105	1 155	1 256	12 72	0 059	0 652	0 725	10 53	0 028	0 337	0 377	10 62
4197 257	0 105	1 155	1 256	12 72	0 059	0 652	0 725	10 53	0 030	0 361	0 401	11 29
4203 730	0 106	1 163	1 264	12 80	0 063	0 698	0 771	11 20	0 032	0 382	0 422	11 88
4207 566	0 106	1 162	1 263	12 79	0 062	0 685	0 758	11 01	0 030	0 360	0 400	11 27
4216 136	0 106	1 156	1 257	12 73	0 062	0 683	0 756	10 98	0 029	0 348	0 388	10 93
4220 509	0 106	1 155	1 256	12 72	0 062	0 683	0 756	10 98	0 030	0 358	0 398	11 21
4232 887	0 106	1 153	1 254	12 70	0 062	0 683	0 756	10 98	0 031	0 369	0 409	11 52
4233 328	0 108	1 175	1 276	12 92	0 064	0 705	0 778	11 30	0 030	0 357	0 397	11 18
4257 815	0 108	1 168	1 269	12 85	0 064	0 701	0 774	11 24	0 032	0 376	0 416	11 72
4258 477	0 109	1 174	1 275	12 91	0 064	0 698	0 771	11 20	0 031	0 365	0 405	11 41
4265 418	0 107	1 153	1 254	12 70	0 064	0 698	0 771	11 20	0 032	0 376	0 416	11 72
4266 081	0 110	1 186	1 287	13 04	0 063	0 688	0 761	11 05	0 031	0 365	0 405	11 41
4268 915	0 109	1 172	1 273	12 89	0 064	0 695	0 768	11 15	0 032	0 375	0 415	11 69
4276 836	0 107	1 150	1 251	12 67	0 064	0 695	0 768	11 15	0 030	0 352	0 392	11 04
4283 169	0 108	1 159	1 260	12 76	0 063	0 684	0 757	10 99	0 031	0 364	0 404	11 38
4284 838	0 108	1 158	1 259	12 75	0 062	0 675	0 748	10 86	0 033	0 386	0 426	12 00
4287 566	0 108	1 157	1 258	12 74	0 062	0 675	0 748	10 86	0 031	0 363	0 403	11 35
4288 310	0 110	1 178	1 279	12 95	0 064	0 694	0 767	11 14	0 032	0 375	0 415	11 69
4289 525	0 108	1 170	1 271	12 87	0 062	0 674	0 747	10 85	0 031	0 363	0 403	11 35
4290 377	0 109	1 179	1 280	12 96	0 061	0 663	0 736	10 69	0 030	0 352	0 392	11 04
4290 542	0 108	1 168	1 269	12 85	0 063	0 683	0 756	10 98	0 033	0 386	0 426	12 00
4291 630	0 108	1 167	1 268	12 84	0 060	0 651	0 724	10 51	0 030	0 352	0 392	11 04

TABLE II —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 147 1908, Aug 5, 10^h 30^m G M T Measured by L on T Distance from Limb 1 5 mm Quality, good

	°	$p-P$ °	π °	ϕ °	η °	sec η
		−0 3				
O	133 0	13 2	14 6	75 4	25 3	1 106
O−Ω	58 5	28 7	29 3	60 7	12 7	1 025
P	−12 7	44 2	44 5	45 5	8 8	1 012
D	6 2	59 7	59 9	30 1	7 2	1 008
Diameter	168 6 mm	74 7	74 8	15 2	6 4	1 006
Factor	1 018	89 7	89 7	0 3	6 2	1 006

λ	$\phi = 0°3$				$\phi = 15°2$				$\phi = 30°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 174	1 905	2 039	14 48	0 164	1 796	1 928	14 18	0 143	1 568	1 689	13 86
4197 257	0 174	1 905	2 039	14 48	0 165	1 806	1 938	14 26	0 143	1 568	1 689	13 86
4203 730	0 075	1 912	2 046	14 53	0 167	1 825	1 957	14 40	0 144	1 578	1 699	13 94
4207 566	0 176	1 921	2 055	14 59	0 168	1 833	1 965	14 46	0 144	1 574	1 695	13 91
4216 136	0 175	1 905	2 039	14 48	0 166	1 807	1 939	14 26	0 143	1 554	1 675	13 75
4220 509	0 176	1 914	2 048	14 54	0 168	1 827	1 959	14 41	0 145	1 574	1 695	13 91
4232 887	0 177	1 917	2 051	14 56	0 168	1 820	1 952	14 36	0 145	1 573	1 694	13 90
4233 328	0 178	1 927	2 061	14 63	0 168	1 819	1 951	14 35	0 144	1 562	1 683	13 81
4257 815	0 179	1 925	2 059	14 62	0 170	1 828	1 960	14 42	0 146	1 570	1 691	13 88
4258 477	0 178	1 914	2 048	14 54	0 170	1 828	1 960	14 42	0 146	1 570	1 691	13 88
4265 418	0 179	1 922	2 056	14 60	0 173	1 856	1 988	14 62	0 146	1 569	1 690	13 87
4266 081	0 180	1 931	2 065	14 66	0 170	1 825	1 957	14 40	0 144	1 542	1 663	13 65
4268 915	0 178	1 908	2 042	14 50	0 170	1 823	1 955	14 38	0 148	1 583	1 704	13 98
4276 836	0 179	1 916	2 050	14 55	0 171	1 826	1 958	14 40	0 146	1 562	1 683	13 81
4283 169	0 180	1 921	2 055	14 59	0 171	1 826	1 958	14 40	0 145	1 551	1 672	13 72
4284 838	0 180	1 920	2 054	14 58	0 173	1 847	1 979	14 56	0 146	1 565	1 686	13 84
4287 566	0 181	1 930	2 064	14 65	0 172	1 835	1 967	14 47	0 146	1 564	1 685	13 83
4288 310	0 180	1 919	2 053	14 58	0 173	1 846	1 978	14 55	0 145	1 554	1 675	13 74
4289 525	0 181	1 929	2 063	14 65	0 174	1 856	1 988	14 63	0 148	1 581	1 702	13 97
4290 377	0 180	1 919	2 053	14 58	0 170	1 81[illegible]	1 944	14 30	0 146	1 562	1 683	13 81
4290 542	0 180	1 918	2 052	14 57	0 171	1 822	1 954	14 38	0 145	1 552	1 673	13 73
4291 630	0 180	1 918	2 052	14 57	0 172	1 832	1 964	14 45	0 148	1 580	1 701	13 96

λ	$\phi = 45°5$				$\phi = 60°7$				$\phi = 75°4$			
4196 699	0 102	1 132	1 233	12 49	0 062	0 689	0 762	11 07	0 029	0 349	0 389	10 96
4197 257	0 104	1 145	1 246	12 62	0 062	0 689	0 762	11 07	0 030	0 358	0 398	11 21
4203 730	0 106	1 164	1 265	12 81	0 063	0 698	0 771	11 20	0 030	0 357	0 397	11 18
4207 566	0 106	1 163	1 264	12 80	0 063	0 698	0 771	11 20	0 030	0 357	0 397	11 18
4216 136	0 107	1 171	1 272	12 88	0 063	0 697	0 770	11 18	0 029	0 347	0 387	10 90
4220 509	0 106	1 157	1 258	12 74	0 063	0 697	0 770	11 18	0 032	0 379	0 419	11 80
4232 887	0 106	1 156	1 257	12 73	0 063	0 697	0 770	11 18	0 030	0 354	0 394	11 10
4233 328	0 108	1 176	1 277	12 93	0 066	0 727	0 800	11 62	0 030	0 354	0 394	11 10
4257 815	0 109	1 179	1 280	12 96	0 066	0 719	0 792	11 50	0 032	0 370	0 410	11 55
4258 477	0 110	1 189	1 290	13 07	0 066	0 719	0 792	11 50	0 032	0 370	0 410	11 55
4265 418	0 108	1 162	1 263	12 79	0 066	0 719	0 792	11 50	0 032	0 370	0 410	11 55
4266 081	0 108	1 162	1 263	12 79	0 065	0 706	0 779	11 31	0 030	0 350	0 390	10 98
4268.915	0 109	1 171	1 272	12 88	0 065	0 706	0 779	11 31	0 030	0 350	0 390	10 98
4276 836	0 109	1 171	1 272	12 88	0 066	0 715	0 788	11 44	0 031	0 360	0 400	11 27
4283 169	0 108	1 160	1 261	12 77	0 065	0 705	0 778	11 30	0 032	0 370	0 410	11 55
4284 838	0 111	1 192	1 293	13 10	0 066	0 715	0 788	11 44	0 032	0 370	0 410	11 55
4287 566	0 108	1 163	1 264	12 80	0 068	0 738	0 811	11 78	0 032	0 370	0.410	11 55
4288 310	0 110	1 182	1 283	13 00	0 067	0 728	0 801	11 63	0 030	0 350	0 390	10 98
4289 525	0 111	1 191	1 292	13 09	0 065	0 705	0 778	11 30	0 032	0 370	0.410	11 55
4290 377	0 109	1 169	1 270	12 86	0 064	0 695	0 768	11 15	0 031	0 360	0 400	11 27
4290 542	0 109	1 169	1 270	12 86	0 065	0 704	0 777	11 28	0 030	0 350	0 390	10.98
4291 630	0 110	1 179	1 280	12 96	0 065	0 704	0 777	11 28	0 033	0 385	0 425	11 97

TABLE II —RESULTS FOR INDIVIDUAL PLATES. OBSERVATIONS OF 1908 — Continued

Plate ω 148 1908, Aug 5, $10^h 30^m$ G M T Measured by L on T Distance from Limb 1 4 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		−0 3				
O	133 0	13 2	14 6	75 4	25 3	1 106
O−Ω	58 5	28 7	29 3	60 7	12 7	1 025
P	−12 7	44 2	44 5	45 5	8 8	1 012
D	6 2	59 7	59 9	30 1	7 2	1 008
Diameter	168 6 mm	74 7	74 8	15 2	6 4	1 006
Factor	1 017	89 7	89 7	0 3	6 2	1 006

λ	$\phi = 0°3$				$\phi = 15°2$				$\phi = 30°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 173	1 896	2 030	14 41	0 166	1 817	1 949	14 34	0 142	1 558	1 679	13 78
4197 257	0 175	1 916	2 050	14 55	0 165	1 807	1 939	14 26	0 143	1 568	1 689	13 86
4203 730	0 174	1 903	2 037	14 46	0 166	1 811	1 943	14 29	0 144	1 576	1 697	13 93
4207 566	0 176	1 921	2 055	14 59	0 167	1 821	1 953	14 37	0 146	1 597	1 718	14 10
4216 136	0 176	1 913	2 047	14 53	0 167	1 818	1 950	14 35	0 144	1 570	1 691	13 88
4220 509	0 178	1 936	2 070	14 70	0 169	1 831	1 963	14 44	0 145	1 579	1 700	13 95
4232 887	0 176	1 911	2 045	14 52	0 167	1 811	1 943	14 29	0 145	1 573	1 694	13 90
4233 328	0 178	1 927	2 061	14 64	0 170	1 841	1 973	14 52	0 144	1 562	1 683	13 81
4257 815	0 178	1 915	2 049	14 55	0 170	1 827	1 959	14 41	0 146	1 574	1 695	13 91
4258 477	0 178	1 914	2 048	14 54	0 168	1 807	1 939	14 26	0 147	1 583	1 704	13 98
4265 418	0 180	1 929	2 063	14 65	0 170	1 824	1 956	14 39	0 145	1 560	1 681	13 79
4266 081	0 180	1 928	2 062	14 64	0 170	1 824	1 956	14 39	0 146	1 569	1 690	13 87
4268 915	0 178	1 908	2 042	14 50	0 172	1 842	1 974	14 52	0 146	1 563	1 684	13 82
4276 836	0 175	1 873	2 007	14 27	0 172	1 841	1 973	14 52	0 147	1 573	1 694	13 90
4283 169	0 181	1 935	2 069	14 69	0 170	1 815	1 947	14 33	0 146	1 562	1 683	13 81
4284 838	0 182	1 945	2 079	14 76	0 170	1 815	1 947	14 33	0 146	1 561	1 682	13 80
4287 566	0 182	1 943	2 077	14 75	0 173	1 849	1 981	14 57	0 144	1 540	1 661	13 63
4288 310	0 181	1 931	2 065	14 66	0 172	1 837	1 969	14 49	0 145	1 550	1 671	13 71
4289 525	0 182	1 941	2 075	14 73	0 172	1 836	1 968	14 48	0 147	1 570	1 691	13 88
4290 377	0 181	1 929	2 063	14 65	0 172	1 835	1 967	14 47	0 147	1 570	1 691	13 88
4290 542	0 182	1 939	2 073	14 72	0 174	1 853	1 985	14 60	0 146	1 559	1 680	13 78
4291 630	0 182	1 939	2 073	14 72	0 172	1 833	1 965	14 46	0 146	1 559	1 680	13 78

λ	$\phi = 45°5$				$\phi = 60°7$				$\phi = 75°4$			
4196 699	0 107	1 177	1 278	12 94	0 064	0 713	0 786	11 41	0 029	0 348	0 388	10 93
4197 257	0 105	1 157	1 258	12 74	0 064	0 713	0 786	11 41	0 030	0 358	0 398	11 21
4203 730	0 106	1 165	1 266	12 82	0 067	0 733	0 806	11 70	0 030	0 358	0 398	11 21
4207 566	0 107	1 174	1 275	12 91	0 065	0 721	0 794	11 53	0 031	0 368	0 408	11 49
4216 136	0 106	1 158	1 259	12 75	0 064	0 710	0 783	11 37	0 030	0 356	0 396	11 15
4220 509	0 108	1 177	1 278	12 94	0 066	0 730	0 803	11 66	0 031	0 366	0 406	11 43
4232 887	0 107	1 165	1 266	12 82	0 068	0 738	0 811	11 78	0 031	0 366	0 406	11 43
4233 328	0 107	1 165	1 266	12 82	0 065	0 716	0 789	11 46	0 032	0 376	0 416	11 72
4257 815	0 107	1 153	1 254	12 70	0 068	0 733	0 806	11 70	0 031	0 361	0 401	11 29
4258 477	0 108	1 163	1 264	12 80	0 068	0 732	0 805	11 69	0 032	0 371	0 411	11 58
4265 418	0 107	1 153	1 254	12 70	0 068	0 731	0 804	11 67	0 031	0 361	0 401	11 29
4266 081	0 108	1 163	1 264	12 80	0 066	0 720	0 793	11 52	0 031	0 361	0 401	11 29
4268 915	0 107	1 151	1 252	12 68	0 068	0 728	0 801	11 63	0 032	0 371	0 411	11 58
4276 836	0 108	1 161	1 262	12 78	0 068	0 728	0 801	11 63	0 032	0 371	0 411	11 58
4283 169	0 110	1 181	1 282	12 98	0 069	0 738	0 811	11 78	0 031	0 361	0 401	11 29
4284 838	0 108	1 159	1 260	12 76	0 067	0 718	0 791	11 49	0 032	0 360	0 400	11 27
4287 566	0 107	1 149	1 250	12 66	0 068	0 728	0 801	11 63	0 030	0 350	0 390	10 98
4288 310	0 108	1 161	1 262	12 78	0 067	0 727	0 800	11 62	0 032	0 370	0 410	11 55
4289 525	0 110	1 181	1 282	12 98	0 068	0 726	0 799	11 60	0 031	0 360	0 400	11 27
4290 377	0 108	1 160	1 261	12 77	0 066	0 718	0 791	11 49	0 032	0 370	0 410	11 55
4290 542	0 110	1 179	1 280	12 96	0 067	0 726	0 799	11 60	0 032	0 370	0 410	11 55
4291 630	0 108	1 158	1 259	12 75	0 067	0 726	0 799	11 60	0 031	0 360	0 400	11 27

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 151 1908, Aug 6, $5^h\ 15^m$ G M T Measured by L on T Distance from Limb 1 5 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		0 3				
O	133 8	13 8	15 1	74 9	24 6	1 100
O−Ω	59 3	29 6	30 2	59 8	12 5	1 024
P	−13 1	45 1	45 4	44 6	8 8	1 012
D	6 3	75 3	75 4	14 6	6 4	1 006
Diameter	168 6 mm	90 3	90 3	−0 3	6 2	1 006
Factor	1 018					

λ	$\phi = -0°3$				$\phi = -0°3$				$\phi = 14°6$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 174	1 908	2 042	14 50	0 173	1 899	2 033	14 43	0 163	1 788	1 920	14 09
4197 257	0 175	1 918	2 052	14 57	0 175	1 918	2 052	14 57	0 164	1 797	1 929	14 15
4203 730	0 177	1 936	2 070	14 70	0 178	1 936	2 070	14 70	0 166	1 815	1 947	14 28
4207 566	0 176	1 918	2 052	14 57	0 177	1 928	2 062	14 64	0 165	1 803	1 935	14 20
4216 136	0 176	1 915	2 049	14 55	0 175	1 905	2 039	14 47	0 165	1 799	1 931	14 17
4220 509	0 176	1 911	2 045	14 52	0 177	1 921	2 055	14 60	0 167	1 813	1 945	14 28
4232 887	0 180	1 949	2 083	14 79	0 176	1 908	2 042	14 50	0 168	1 821	1 953	14 32
4233 328	0 177	1 918	2 052	14 57	0 177	1 918	2 052	14 57	0 168	1 821	1 953	14 32
4257 815	0 180	1 937	2 071	14 71	0 180	1 937	2 071	14 71	0 169	1 819	1 951	14 31
4258 477	0 182	1 959	2 093	14 86	0 179	1 928	2 062	14 64	0 168	1 809	1 941	14 24
4265 418	0 179	1 923	2 057	14 61	0 180	1 933	0 067	14 68	0 170	1 827	1 959	14 38
4266 081	0 180	1 932	2 066	14 67	0 179	1 922	2 056	14 61	0 170	1 826	1 958	14 37
4268 915	0 180	1 930	2 064	14 66	0 180	1 930	2 064	14 65	0 171	1 829	1 961	14 39
4276 836	0 180	1 928	2 062	14 64	0 180	1 928	2 062	14 64	0 171	1 828	1 960	14 38
4283 169	0 181	1 933	2 067	14 68	0 179	1 913	2 047	14 54	0 170	1 818	1 950	14 30
4284 838	0 181	1 933	2 067	14 68	0 181	1 933	2 067	14 68	0 172	1 838	1 970	14 43
4287 566	0 180	1 922	2 056	14 60	0 181	1 932	2 066	14 67	0 170	1 818	1 950	14 30
4288 310	0 179	1 912	2 046	14 53	0 181	1 932	2 066	14 67	0 172	1 837	1 969	14 44
4289 525	0 182	1 942	2 076	14 74	0 182	1 942	2 076	14 74	0 171	1 827	1 959	14 37
4290 377	0 180	1 921	2 055	14 59	0 181	1 931	2 065	14 66	0 171	1 827	1 959	14 37
4290 542	0 182	1 942	2 076	14 74	0 181	1 932	2 066	14 67	0 173	1 845	1 977	14 50
4291 630	0 181	1 931	2.065	14 66	0 182	1 941	2 075	14 73	0 172	1 835	1 967	14 43

λ	$\phi = 44°6$				$\phi = 59°8$				$\phi = 74°9$			
4196 699	0 105	1 159	1 260	12 56	0 065	0 724	0 797	11 25	0 029	0 348	0 388	10 57
4197 257	0 105	1 158	1 259	12 55	0 064	0 714	0 787	11 11	0 030	0 358	0 398	10 85
4203 730	0 106	1 164	1 265	12 61	0 066	0 734	0 807	11 39	0 030	0 357	0 397	10 82
4207 566	0 106	1 162	1 263	12 59	0 067	0 745	0 818	11 55	0 031	0 368	0 408	11 12
4216 136	0 104	1 140	1 241	12 37	0 066	0 732	0 805	11 36	0 031	0 367	0 407	11 09
4220 509	0 106	1 159	1 260	12 56	0 066	0 732	0 805	11 36	0 030	0 357	0 397	10 82
4232 887	0 108	1 178	1 279	12 75	0 067	0 739	0 812	11 46	0 031	0 365	0 405	11 03
4233 328	0 108	1 178	1 279	12 75	0 068	0 749	0 822	11 60	0 031	0 365	0 405	11 03
4257 815	0 109	1 177	1 278	12 74	0 069	0 753	0 826	11 66	0 033	0 388	0 428	11 66
4258 477	0 108	1 166	1 267	12 63	0 067	0 733	0 806	11 38	0 032	0 376	0 416	11 34
4265 418	0 108	1 164	1 265	12 61	0 064	0 702	0 775	10 94	0 032	0 376	0 416	11 34
4266 081	0 109	1 174	1 275	12 71	0 065	0 711	0 784	11 06	0 032	0 374	0 414	11 28
4268 915	0 108	1 164	1 265	12 61	0 069	0 750	0 823	11 61	0 032	0 374	0 414	11 28
4276 836	0 109	1 172	1 273	12 69	0 068	0 739	0 812	11 46	0 032	0 374	0 414	11 28
4283 169	0 110	1 182	1 283	12 79	0 068	0 739	0 812	11 46	0 033	0 384	0 424	11 55
4284 838	0 109	1 171	1 272	12 68	0 068	0 739	0 812	11 46	0 034	0 396	0 436	11 88
4287 566	0 110	1 181	1 282	12 78	0 069	0 749	0 822	11 60	0 034	0 396	0 436	11 88
4288 310	0 108	1 161	1 262	12 58	0 066	0 718	0 791	11 16	0 032	0 374	0 414	11 28
4289 525	0 109	1 170	1 271	12 67	0 068	0 739	0 812	11 46	0 032	0 374	0 414	11 28
4290 377	0 109	1 170	1 271	12 67	0 068	0 739	0 812	11 46	0 033	0 385	0 425	11 58
4290 542	0 110	1 180	1 281	12 77	0 068	0 739	0 812	11 46	0 033	0 396	0 436	11 88
4291 630	0 110	1 180	1 281	12 77	0 071	0 771	0 844	11 75	0 034	0 396	0 436	11 88

TABLE II — RESULTS FOR INDIVIDUAL PLATES   OBSERVATIONS OF 1908 — Continued

Plate ω 161. 1908, Aug 26, 11h 0m G M T   Measured by L on T   Distance from Limb 1 1 mm   Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		−0 3				
☉	153 3	24 1	25 0	65 0	17 0	1 049
☉−Ω	78 8	40 1	40 6	49 4	11 0	1 018
P	−19 8	55 5	55 8	34 2	8 6	1 016
D	7 1	70 7	70 9	19 1	7 5	1 009
Diameter	168 9 mm	79 0	79 1	10 9	7 2	1 008
Factor	1 013	85 8	85 8	4 2	7 1	1 008

λ	$\phi = 4°2$				$\phi = 10°9$				$\phi = 19°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 172	1 879	2 015	14 34	0 168	1 836	1 970	14 24	0 159	1 739	1 867	14 04
4197 257	0 173	1 888	2 024	14 41	0 168	1 836	1 970	14 24	0 159	1 739	1 867	14 04
4203 730	0 175	1 913	2 049	14 59	0 169	1 840	1 974	14 27	0 162	1 766	1 890	14 21
4207 566	0 175	1 910	2 046	14 56	0 168	1 828	1 962	14 19	0 161	1 753	1 881	14 14
4216 136	0 175	1 908	2 044	14 55	0 168	1 826	1 960	14 17	0 161	1 751	1 879	14 13
4220 509	0 176	1 905	2 041	14 53	0 172	1 867	2 001	14 47	0 163	1 766	1 894	14 24
4232 887	0 176	1 902	2 038	14 51	0 173	1 869	2 003	14 49	0 164	1 774	1 902	14 30
4233 328	0 176	1 902	2 038	14 51	0 172	1 859	1 993	14 42	0 165	1 784	1 912	14 37
4257 815	0 179	1 920	2 056	14 63	0 176	1 884	2 018	14 59	0 163	1 744	1 872	14 08
4258 477	0 178	1 910	2 046	14 56	0 174	1 864	1 998	14 45	0 164	1 753	1 881	14 14
4265 418	0 179	1 918	2 054	14 62	0 172	1 842	1 976	14 29	0 164	1 753	1 881	14 14
4266 081	0 179	1 917	2 053	14 61	0 175	1 867	2 001	14 47	0 167	1 783	1 911	14 36
4268 915	0 180	1 926	2 062	14 68	0 174	1 856	1 990	14 39	0 166	1 772	1 900	14 28
4276 836	0 176	1 878	2 014	14 34	0 174	1 855	1 989	14 38	0 164	1 751	1 879	14 13
4283 169	0 180	1 918	2 054	14 62	0 175	1 865	1 999	14 46	0 167	1 781	1 909	14 35
4284 838	0 180	1 916	2 052	14 61	0 174	1 855	1 989	14 38	0 165	1 760	1 888	14 19
4287 566	0 180	1 916	2 052	14 61	0 175	1 864	1 998	14 45	0 165	1 760	1 888	14 19
4288 310	0 179	1 906	2 042	14 54	0 175	1 864	1 998	14 45	0 165	1 760	1 888	14 19
4289 525	0 179	1 906	2 042	14 54	0 174	1 854	1 988	14 38	0 162	1 725	1 853	13 93
4290 377	0 179	1 905	2 041	14 53	0 174	1 854	1 988	14 38	0 162	1 725	1 853	13 93
4290 542	0 180	1 915	2 051	14 60	0 174	1 853	1 987	14 37	0 164	1 747	1 875	14 10
4291 630	0 180	1 915	2 051	14 60	0 176	1 873	2 006	14 51	0 166	1 768	1 896	14 25

λ	$\phi = 34°2$				$\phi = 49°4$				$\phi = 65°0$			
4196 699	0 128	1 404	1 519	13 03	0 088	0 972	1 061	11 57	0 048	0 541	0 599	10 06
4197 257	0 128	1 404	1 519	13 03	0 088	0 972	1 061	11 57	0 048	0 541	0 599	10 06
4203 730	0 128	1 412	1 528	13 12	0 090	0 992	1 081	11 79	0 049	0 551	0 609	10 23
4207 566	0 131	1 430	1 545	13 25	0 090	0 990	1 079	11 77	0 050	0 561	0 619	10 40
4216 136	0 132	1 438	1 553	13 32	0 090	0 988	1 077	11 75	0 047	0 530	0 588	9 88
4220 509	0 131	1 426	1 541	13 22	0 092	1 005	1 094	11 93	0 050	0 559	0 617	10 37
4232 887	0 132	1 434	1 549	13 29	0 091	0 994	1 083	11 81	0 051	0 569	0 627	10 54
4233 328	0 132	1 431	1 546	13 26	0 090	0 984	1 073	11 70	0 051	0 569	0 627	10 54
4257 815	0 135	1 450	1 565	13 43	0 092	0 996	1 085	11 83	0 054	0 599	0 657	11 04
4258 477	0 135	1 450	1 565	13 43	0 092	0 996	1 085	11 83	0 054	0 598	0 656	11 02
4265 418	0 133	1 429	1 544	13 24	0 090	0 974	1 063	11 59	0 053	0 588	0 646	10 85
4266 081	0 135	1 445	1 560	13 38	0 092	0 992	1 081	11 79	0 052	0 575	0 633	10 63
4268 915	0 135	1 445	1 560	13 38	0 093	1 002	1 091	11 90	0 053	0 585	0 643	10 80
4276 836	0 133	1 424	1 539	13 20	0 092	0 992	1 081	11 79	0 053	0 585	0 643	10 80
4283 169	0 134	1 435	1 550	13 30	0 092	0 992	1 081	11 79	0 052	0 575	0 633	10 63
4284 838	0 134	1 435	1 550	13 30	0 090	0 972	1 061	11 57	0 052	0 576	0 634	10 65
4287 566	0 134	1 435	1 550	13 30	0 092	0 991	1 080	11 78	0 053	0 586	0 644	10 82
4288 310	0 136	1 451	1 566	13 43	0 093	1 001	1 090	11 89	0 053	0 586	0 644	10 82
4289 525	0 133	1 421	1 536	13 18	0 092	0 991	1 080	11 78	0 051	0 565	0 623	10 47
4290 377	0 135	1 441	1 556	13 35	0 091	0 981	1 070	11 67	0 052	0 575	0 633	10 63
4290 542	0 135	1 441	1 556	13 35	0 093	1 001	1 090	11 89	0 054	0 595	0 653	10 97
4291 630	0 133	1 420	1 535	13 17	0 095	1 021	1 110	12 11	0 054	0 595	0 653	10 97

TABLE II —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 162   1908, Aug 26, 11ʰ 0ᵐ G M T   Measured by L on T   Distance from Limb 1 1 mm   Quality, good

	°	$p-P$ °	π °	ϕ °	η °	sec η
		−0 3				
☉	153 3	24 1	25 0	65 0	17 0	1 046
☉−Ω	78 8	40 1	40 6	49 4	11 0	1 019
P	−19 8	55 5	55 8	34 2	8 6	1 011
D	7 1	70 7	70 9	19 1	7 5	1 009
Diameter	168 9 mm	79 0	79 1	10 9	7 2	1 008
Factor	1 013	85 8	85 8	4 2	7 1	1 008

λ	$\phi = 4°2$ Δ	v	$v+v_1$	ξ	$\phi = 10°9$ Δ	v	$v+v_1$	ξ	$\phi = 19°1$ Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 174	1 901	2 037	14 50	0 168	1 838	1 972	14 25	0 157	1 719	1 847	13 88
4197 257	0 174	1 901	2 037	14 50	0 168	1 838	1 972	14 25	0 158	1 728	1 856	13 95
4203 730	0 175	1 909	2 045	14 56	0 170	1 853	1 987	14 36	0 160	1 743	1 871	14 06
4207 566	0 176	1 914	2 050	14 59	0 169	1 841	1 975	14 27	0 161	1 751	1 879	14 13
4216 136	0 175	1 901	2 037	14 50	0 170	1 848	1 982	14 32	0 159	1 729	1 857	13 97
4220 509	0 177	1 917	2 053	14 61	0 170	1 845	1 979	14 30	0 162	1 755	1 883	14 16
4232 887	0 178	1 924	2 060	14 66	0 170	1 840	1 974	14 26	0 161	1 743	1 871	14 07
4233 328	0 180	1 944	2 080	14 80	0 173	1 870	2 004	14 48	0 164	1 773	1 901	14 29
4257 815	0 179	1 921	2 057	14 64	0 172	1 848	1 982	14 32	0 165	1 766	1 894	14 25
4258 477	0 178	1 910	2 046	14 56	0 173	1 857	1 991	14 39	0 164	1.754	1 882	14 15
4265 418	0 179	1 915	2 051	14 59	0 173	1 854	1 988	14 37	0 163	1 742	1 870	14 06
4266 081	0 179	1 914	2 050	14 59	0 175	1 874	2 008	14 52	0 164	1 752	1 880	14 13
4268 915	0 180	1 919	2 055	14 63	0 174	1 856	1 990	14 38	0 164	1 751	1 879	14 12
4276 836	0 181	1 928	2 064	14 69	0 174	1 855	1 989	14 37	0 164	1 749	1 877	14 11
4283 169	0 178	1 897	2 033	14 47	0 174	1 854	1 988	14 37	0 165	1 759	1 887	14 19
4284 838	0 180	1 914	2 050	14 59	0 173	1 842	1 976	14 28	0 164	1 747	1 875	[illegible]
4287 566	0 180	1 913	2 049	14 58	0 174	1 852	1 986	14 35	0 163	1 737	1 865	14 02
4288 310	0 180	1 913	2 049	14 58	0 174	1 851	1 985	14 34	0 164	1 747	1 875	14 10
4289 525	0 180	1 913	2 049	14 58	0 175	1 861	1 995	14 41	0 164	1.747	1 875	14 10
4290 377	0 178	1 893	2 029	14 44	0 174	1 851	1 985	14 34	0 164	1 747	1 875	14 10
4290 542	0 178	1 893	2 029	14 44	0 176	1 872	2 006	14 50	0 165	1 756	1 884	14 17
4291 630	0 179	1 903	2 039	14 51	0 175	1 862	1 996	14 43	0 165	1 756	1 884	14 17

λ	$\phi = 34°2$ Δ	v	$v+v_1$	ξ	$\phi = 49°4$ Δ	v	$v+v_1$	ξ	$\phi = 65°0$ Δ	v	$v+v_1$	ξ	$\phi = 65°0$* Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 125	1 371	1 486	12 76	0 095	1 049	1 138	12 42	0 057	0 646	0 704	11 83	0 050	0 569	0 627	10 53
4197 257	0 125	1 371	1 486	12 76	0 095	1 049	1 138	12 42	0 058	0 656	0 714	12 00	0 053	0 603	0 661	11 10
4203 730	0 126	1 381	1 496	12 84	0 097	1 068	1 157	12 62	0 058	0 655	0 713	11 98	0 055	0 625	0 683	11 47
4207 566	0 126	1 377	1 492	12 81	0 094	1 035	1 124	12 26	0 056	0 635	0 693	11 64	0 050	0 567	0 625	10 50
4216 136	0 126	1 374	1 489	12 78	0 096	1 053	1 142	12 46	0 059	0.660	0 718	12 06	0 050	0 565	0 623	10 47
4220 509	0 129	1 405	1 520	13 05	0 097	1 060	1 149	12 53	0 057	0 640	0 698	11.73	0 057	0 643	0 701	11 78
4232 887	0 127	1 379	1 494	12 82	0 097	1 058	1 147	12 51	0 058	0 649	0 707	11 87	0 056	0 630	0 688	11 56
4233 328	0 129	1 399	1 514	12 99	0 096	1 048	1 137	12 40	0 058	0 649	0 707	11 87	0 052	0 585	0 643	10 80
4257 815	0 130	1 400	1 515	13 00	0 098	1 063	1 152	12 57	0 058	0 645	0 703	11 81	0 057	0 637	0 695	11 68
4258 477	0 129	1 390	1 505	12 92	0 098	1 063	1 152	12 57	0 059	0 655	0 713	11 98	0 057	0 636	0 694	11 66
4265 418	0 129	1 389	1 504	12 91	0 097	1 047	1 136	12 39	0 058	0 643	0 701	11 78	0 053	0 590	0 648	10 88
4266 081	0 131	1 408	1 523	13 07	0 098	1 057	1 146	12 50	0 058	0 643	0 701	11 78	0 054	0 580	0 638	10 72
4268 915	0 130	1 394	1 509	12 95	0 098	1 056	1 145	12 49	0 060	0 664	0 722	12 13	0 057	0 635	0 693	11 64
4276 836	0 130	1 390	1 505	12 92	0 098	1 055	1 144	12 48	0 059	0 651	0 709	11 91	0 055	0 611	0 669	11 24
4283 169	0 131	1 400	1 515	13 00	0 099	1 065	1 154	12 59	0 060	0 661	0 719	12 08	0 060	0 665	0 723	11 15
4284 838	0 130	1 390	1 505	12 92	0 099	1 064	1 153	12 58	0 061	0 650	0 708	11 89	0 055	0 609	0 667	11 20
4287 566	0 130	1 390	1 505	12 92	0 097	1 044	1 133	12 36	0 058	0 640	0 698	11 73	0 057	0 630	0 688	11 56
4288 310	0 131	1 399	1 514	12 99	0 098	1 053	1 142	12 46	0 061	0 670	0 728	12 23	0 058	0 642	0 700	11 76
4289 525	0 131	1 399	1 514	12 99	0 099	1 063	1 152	12.57	0 060	0 660	0 718	12 06	0 061	0 675	0 733	[illegible] 31
4290 377	0 129	1 379	1 494	12 82	0 097	1 043	1 132	12.35	0 058	0 640	0 698	11 73	0 057	0 632	0 690	11 59
4290 542	0 132	1 409	1 524	13 08	0 099	1 063	1 152	12 57	0 060	0 660	0 718	12 06	0.060	0.665	0 723	12 15
4291 630	0 129	1 378	1 493	12 82	0 098	1 053	1 142	12 46	0 060	0 660	0 718	12 06	0 058	0 655	0 713	11 98

* Measured by A on G

TABLE II —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 163 1908, Aug 26, 11^h 55^m G M T Measured by L on T Distance from Limb 1 1 mm Quality, good

	°	$p-P$ °	π °	ϕ °	η °	sec η
		−0 3				
O	153 3	24 1	25 0	65 0	17 0	1 046
O−Ω	78 8	40 1	40 6	49 4	11 0	1 019
P	−19 8	55 5	55 8	34 2	8 6	1 011
D	7 1	70 7	70 9	19 1	7 5	1 009
Diameter	168 9 mm	79 0	79 1	10 9	7 2	1 008
Factor	1 013	85 8	85 8	4 2	7 1	1 008

λ	ϕ = 4°2				ϕ = 10°9				ϕ = 19°1			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 172	1 880	2 016	14 34	0 170	1 859	1 993	14 40	0 160	1 750	1 878	14 12
4197 257	0 172	1 880	2 016	14 34	0 170	1 859	1 993	14 40	0 160	1 750	1 878	14 12
4203 730	0 173	1 889	2 025	14 42	0 173	1 887	2 021	14 60	0 162	1 768	1 896	14 25
4207 566	0 173	1 885	2 021	14 38	0 172	1 874	2 008	14 51	0 162	1 765	1 893	14 23
4216 136	0 174	1 890	2 026	14 42	0 170	1 849	1 983	14 33	0 162	1 762	1 890	14 21
4220 509	0 177	1 922	2 058	14 65	0 174	1 888	2 022	14 61	0 163	1 765	1 893	14 23
4232 887	0 177	1 911	2 047	14 57	0 172	1 859	1 993	14 40	0 164	1 773	1 901	14 29
4233 328	0 176	1 901	2 037	14 50	0 174	1 880	2 014	14 55	0 164	1 773	1 901	14 29
4257 815	0 178	1 910	2 046	14 56	0 175	1 879	2 013	14 54	0 166	1 782	1 910	14 36
4258 477	0 178	1 910	2 046	14 56	0 174	1 869	2 003	14 47	0 165	1 773	1 901	14 29
4265 418	0 178	1 909	2 045	14 50	0 176	1 884	2 018	14 58	0 162	1 738	1 866	14 03
4266 081	0 179	1 915	2 051	14 60	0 175	1 874	2 008	14 51	0 165	1 762	1 890	14 21
4268 915	0 178	1 904	2 040	14 52	0 175	1 867	2 001	14 46	0 165	1 761	1 889	14 20
4276 836	0 180	1 917	2 053	14 61	0 175	1 865	1 999	14 45	0 164	1 750	1 878	14 12
4283 169	0 178	1 896	2 032	14 47	0 175	1 865	1 999	14 45	0 164	1 750	1 878	14 12
4284 838	0 180	1 915	2 051	14 60	0 176	1 874	2 008	14 51	0 164	1 748	1 876	14 10
4287 566	0 179	1 905	2 041	14 53	0 175	1 864	1 998	14 44	0 165	1 758	1 886	14 18
4288 310	0 178	1 895	2 031	14 46	0 175	1 864	1 998	14 44	0 164	1 748	1 876	14 10
4289 525	0 180	1 915	2 051	14 60	0 174	1 853	1 987	14 36	0 165	1 758	1 886	14 18
4290 377	0 179	1 905	2 041	14 53	0 175	1 863	1 997	14 43	0 164	1 748	1 876	14 10
4290 542	0 180	1 914	2 050	14 59	0 175	1 863	1 997	14 43	0 165	1 758	1 886	14 18
4291 630	0 180	1 914	2 050	14 59	0 174	1 852	1 986	14 35	0 164	1 747	1 875	14 09

λ	ϕ = 34°2				ϕ = 49°4				ϕ = 65°0				ϕ = 65°0*			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 131	1 441	1 556	13 36	0 094	1 038	1 127	12 30	0 056	0 634	0 692	11 63	0 050	0 569	0 627	10 53
4197 257	0 130	1 430	1 545	13 26	0 094	1 038	1 127	12 30	0 056	0 634	0 692	11 63	0 052	0 592	0 650	10 92
4203 730	0 132	1 443	1 558	13 37	0 096	1 058	1 147	12 52	0 057	0 643	0 701	11 78	0 054	0 612	0 670	11 26
4207 566	0 132	1 440	1 555	13 35	0 096	1 056	1 145	12 49	0 057	0 642	0 700	11 76	0 052	0 589	0 647	10 87
4216 136	0 131	1 429	1 544	13 25	0 095	1 044	1 133	12 36	0 056	0 630	0 688	11 56	0 052	0 588	0 646	10 85
4220 509	0 132	1 437	1 552	13 32	0 096	1 052	1 141	12 45	0 059	0 663	0 721	12 11	0 058	0 654	0 712	11 96
4232 887	0 132	1 435	1 550	13 30	0 099	1 081	1 170	12 77	0 058	0 650	0 708	11 89	0 055	0 618	0 676	11 36
4233 328	0 133	1 442	1 557	13 36	0 098	1 070	1 159	12 65	0 058	0 650	0 708	11 89	0 052	0 585	0 643	10 80
4257 815	0 133	1 433	1 548	13 29	0 099	1 074	1 163	12 69	0 060	0 666	0 724	12 16	0 055	0 615	0 673	11 31
4258 477	0 133	1 433	1 548	13 29	0 098	1 064	1 153	12 58	0 058	0 646	0 704	11 83	0 054	0 605	0 633	11 14
4265 418	0 134	1 435	1 550	13 30	0 096	1 042	1 131	12 34	0 060	0 666	0 724	12 16	0 056	0 624	0 682	11 46
4266 081	0 134	1 435	1 550	13 30	0 098	1 057	1 146	12 50	0 059	0 653	0 711	11 94	0 055	0 614	0 672	11 29
4268 915	0 135	1 444	1 559	13 38	0 098	1 056	1 145	12 49	0 059	0 652	0 710	11 92	0 056	0 623	0 681	11 44
4276 836	0 134	1 433	1 548	13 29	0 099	1 065	1 154	12 59	0 060	0 659	0 717	12 04	0 055	0 613	0 671	11 27
4283 169	0 132	1 412	1 527	13 10	0 099	1 065	1 154	12 59	0 058	0 639	0 697	11 71	0 057	0 631	0 689	11 57
4284 838	0 134	1 433	1 548	13 29	0 098	1 054	1 143	12 47	0 060	0 659	0 717	12 04	0 054	0 599	0 657	11 04
4287 566	0 134	1 433	1 548	13 29	0 100	1 075	1 164	12 70	0 059	0 649	0 707	11 88	0 055	0 609	0 667	11 20
4288 310	0 134	1 432	1 547	13 28	0 101	1 085	1 174	12 81	0 060	0 659	0 717	12 04	0 056	0 619	0 677	11 37
4289 525	0 134	1 431	1 546	13 27	0 099	1 064	1 153	12 58	0 058	0 639	0 697	11 71	0 056	0 619	0 677	11 37
4290 377	0 133	1 420	1 535	13 18	0 098	1 053	1 142	12 46	0 058	0 639	0 697	11 71	0 054	0 598	0 656	11 02
4290 542	0 134	1 431	1 546	13 27	0 101	1 085	1 174	12 81	0 060	0 659	0 717	12 04	0 056	0 619	0 677	11 37
4291 630	0 134	1 431	1 546	13 27	0 098	1 053	1 142	12 46	0 059	0 649	0 707	11 88	0 057	0 630	0 688	11 56

*Measured by A on G.

TABLE II —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908—Continued

Plate ω 164 1908, Aug 26, 11^h 55^m G M T Measured by L on T Distance from Limb 1 1 mm Quality, good

	°	$p-P$	π	ϕ	η	sec η
		°	°	°	°	
		−0 3				
⊙	153 3	24 1	25 0	65 0	17 0	1 046
⊙−Ω	78 8	40 1	40 6	49 4	11 0	1 019
P	−19 8	55 5	55 8	34 2	8 6	1 011
D	7 1	70 7	70 9	19 1	7 5	1 009
Diameter	168 9 mm	79 0	79 1	10 9	7 2	1 008
Factor	1 013	85 8	85 8	4 2	7 1	1 008

λ	$\phi = 4°2$				$\phi = 10°9$				$\phi = 19°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 169	1 848	1 984	14 12	0 169	1.858	1 992	14 40	0 159	1 739	1 867	14 04
4197 257	0 171	1 868	2 004	14 26	0 168	1 848	1 982	14 32	0 159	1 739	1 867	14 04
4203 730	0 173	1 885	2 021	14 38	0 170	1 853	1 987	14 36	0 161	1 752	1 880	14 13
4207 566	0 174	1 894	2 030	14 45	0 171	1 860	1 994	14 41	0 160	1 741	1 869	14 05
4216 136	0 174	1 890	2 026	14 42	0 170	1 848	1 982	14 32	0 159	1 729	1 857	13 97
4220 509	0 177	1 920	2 056	14 64	0 173	1 872	2 006	14 50	0 162	1 754	1 882	14 15
4232 887	0 176	1 901	2 037	14 50	0 172	1 859	1 993	14 41	0 162	1 752	1 880	14 13
4233 328	0 176	1 900	2 036	14 49	0 172	1 859	1 993	14 41	0 160	1 730	1 858	13 98
4257 815	0 178	1 898	2 034	14 48	0 174	1 867	2 001	14 46	0 162	1 741	1 869	14 05
4258 477	0 178	1 898	2 034	14 48	0 174	1 867	2 001	14 46	0 163	1 751	1 879	14 12
4265 418	0 177	1 895	2 031	14 46	0 175	1 874	2 008	14 51	0 161	1 726	1 854	13 94
4266 081	0 179	1 915	2 051	14 60	0 175	1 874	2 008	14 51	0 163	1 742	1 870	14 06
4268 915	0 178	1 898	2 034	14 48	0 174	1 861	1 995	14 42	0 163	1 741	1 869	14 05
4276 836	0 177	1 886	2 022	14 39	0 174	1 859	1 993	14 40	0 163	1 739	1 867	14 04
4283 169	0 178	1 896	2 032	14 46	0 175	1 863	1 997	14 44	0 164	1 749	1 877	14 11
4284 838	0 179	1 904	2 040	14 52	0 174	1 853	1 987	14 36	0 162	1 727	1 855	13 95
4287 566	0 178	1 894	2 030	14 45	0 175	1 862	1 996	14 43	0 162	1 726	1 854	13 94
4288 310	0 177	1 884	2 020	14 37	0 174	1 852	1 986	14 35	0 165	1 757	1 885	14 17
4289 525	0 178	1 893	2 029	14 44	0 176	1 872	2 006	14 50	0 164	1 747	1 875	14 10
4290 377	0 178	1 893	2 029	14 44	0 174	1 852	1 986	14 35	0 164	1 747	1 875	14 10
4290 542	0 178	1 893	2 029	14 44	0 176	1 872	2 006	14 50	0 164	1 747	1 875	14 10
4291 630	0 179	1 903	2 039	14 51	0 174	1 852	1 986	14 35	0 165	1 756	1 884	14 16

λ	$\phi = 34°2$				$\phi = 49°4$				$\phi = 65°0$			
4196 699	0 130	1 425	1 540	13 22	0 096	1 059	1 148	12 53	0 055	0 624	0 682	11 46
4197 257	0 130	1 425	1 540	13 22	0 096	1 059	1 148	12 53	0 057	0 644	0 702	11 79
4203 730	0 133	1 455	1 570	13 48	0 097	1 064	1 153	12 58	0 058	0 654	0 712	11 96
4207 566	0 133	1 454	1 569	13 47	0 097	1 062	1 151	12 56	0 057	0 644	0 702	11 79
4216 136	0 131	1 426	1 541	13 23	0 096	1 050	1 139	12 43	0 056	0 630	0 688	11 56
4220 509	0 132	1 434	1 549	13 30	0 097	1 060	1 149	12 54	0 058	0 649	0 707	11 88
4232 887	0 133	1 441	1 556	13 36	0 096	1 048	1 137	12 40	0 057	0 638	0 696	11 69
4233 328	0 133	1 441	1 556	13 36	0 099	1 081	1 170	12 76	0 058	0 648	0 706	11 86
4257 815	0 136	1 460	1 575	13 52								
4258 477	0 134	1 439	1 554	13 34								
4265 418	0 135	1 449	1 564	13 43	0 099	1 072	1 161	12 66	0 058	0 643	0 701	11 77
4266 081	0 134	1 436	1 551	13 31	0 098	1 063	1 152	12 57	0 058	0 642	0 700	11 75
4268 915	0 135	1 444	1 559	13 38	0 099	1 071	1 160	12 65	0 058	0 639	0 697	11 71
4276 836	0 135	1 444	1 559	13 38	0 100	1 077	1 166	12 61	0 059	0 649	0 707	11 88
4283 169	0 134	1 432	1 547	13 28	0 100	1 077	1 166	12 61	0 058	0 639	0 697	11 71
4284 838	0 134	1 432	1 547	13 28	0 098	1 056	1 145	12 49	0 059	0 648	0 706	11 86
4287 566	0 133	1 431	1 546	13 27	0 098	1 055	1 144	12 48	0 058	0 638	0 696	11 69
4288 310	0 136	1 453	1 568	13 46	0 098	1 055	1 144	12 48	0 058	0 638	0.696	11.69
4289 525	0 135	1 442	1 557	13 36	0 099	1 065	1 154	12 59	0 059	0 648	0 706	11 86
4290 377	0 135	1 442	1 557	13 36	0 097	1 044	1 133	12 36	0 059	0 648	0 706	11.86
4290 542	0 137	1 462	1 577	13 54	0 100	1 074	1 163	12 69	0 059	0 648	0 706	11 86
4291 630	0 135	1 441	1 556	13 35	0 100	1 074	1 163	12 60	0 058	0 638	0 696	11 69

TABLE II.—RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908—Continued

Plate ω 165. 1908, Aug 27, 6h 45m G M T Measured by L on T Distance from Limb 1 6 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		−0 2				
O	154 1	24 2	25 2	64 8	17 0	1 046
O−Ω	79 6	40 1	40 6	49 4	11 0	1 019
P	−20 1	55 6	55 9	34 1	8 6	1 011
D	7 1	70 8	70 9	19 1	7 5	1 009
Diameter	168 8 mm	78 3	78 4	11 6	7 3	1 008
Factor	1 019	85 8	85 8	4 2	7 1	1 008

λ	$\phi = 4°2$				$\phi = 11°6$				$\phi = 19°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 169	1 861	1 997	14 22	0 169	1 858	1 992	14 43	0 158	1 738	1 867	14 03
4197 257	0 169	1 861	1 997	14 22	0 168	1 848	1 982	14 36	0 157	1 736	1 865	14 01
4203 730	0 172	1 887	2 023	14 40	0 170	1 864	1 998	14 48	0 160	1 756	1 885	14 16
4207 566	0 173	1 898	2 034	14 48	0 170	1 863	1 997	14 47	0 160	1 752	1 881	14 13
4216 136	0 173	1 883	2 019	14 37	0 171	1 868	2 002	14 52	0 160	1 750	1 879	14 11
4220 509	0 176	1 923	2 059	14 66	0 170	1 852	1 986	14 40	0 161	1 759	1 888	14 19
4232 887	0 175	1 905	2 041	14 53	0 172	1 870	2 004	14 53	0 161	1 763	1 892	14 22
4233 328	0 176	1 915	2 051	14 60	0 171	1 860	1 994	14 43	0 162	1 762	1 891	14 21
4257 815	0 178	1 922	2 058	14 65	0 173	1 870	2 004	14 53	0 163	1 761	1 890	14 20
4258 477	0 175	1 891	2 027	14 43	0 173	1 869	2 003	14 52	0 163	1 761	1 890	14 20
4265 418	0 176	1 896	2 032	14 47	0 172	1 854	1 988	14 41	0 163	1 758	1 887	14 18
4266 081	0 176	1 895	2 031	14 46	0 173	1 857	1 991	14 43	0 162	1 748	1 877	14 10
4268 915	0 178	1 916	2 052	14 61	0 174	1 866	2 000	14 50	0 163	1 756	1 885	14 16
4276 836	0 176	1 892	2 028	14 44	0 173	1 855	1 989	14 42	0 162	1 739	1 868	14 04
4283 169	0 178	1 907	2 043	14 54	0 174	1 865	1 999	14 49	0 163	1 748	1 877	14 10
4284 838	0 176	1 886	2 022	14 40	0 174	1 864	1 998	14 48	0 162	1 737	1 866	14 02
4287 566	0 177	1 898	2 034	14 48	0 172	1 844	1 978	14 34	0 164	1 757	1 886	14 17
4288 310	0 176	1 885	2 021	14 39	0 172	1 843	1 977	14 33	0 163	1 747	1 876	14 09
4289 525	0 178	1 905	2 041	14 53	0 174	1 864	1 998	14 48	0 163	1 747	1 876	14 09
4290 377	0 176	1 884	2 020	14 38	0 173	1 851	1 985	14 39	0 163	1 747	1 876	14 09
4290 542	0 177	1 894	2 030	14 45	0 172	1 841	1 975	14 31	0 164	1 757	1 886	14 17
4291 630	0 178	1 905	2 041	14 53	0 173	1 851	1 985	14 39	0 163	1 747	1 876	14 09
	$\phi = 34°1$				$\phi = 49°4$				$\phi = 64°8$			
4196 699	0 131	1 444	1 558	13 36	0 095	1 054	1 143	12 47	0 054	0 611	0 669	11 15
4197 257	0 130	1 434	1 548	13 27	0 094	1 044	1 133	12 36	0 054	0 611	0 669	11 15
4203 730	0 131	1 443	1 557	13 35	0 094	1 042	1 131	12 34	0 055	0 632	0 690	11 51
4207 566	0 133	1 462	1 576	13 51	0 095	1 054	1 143	12 37	0 055	0 620	0 678	11 31
4216 136	0 132	1 446	1 560	13 37	0 094	1 039	1 128	12 31	0 055	0 618	0 676	11 27
4220 509	0 134	1 467	1 581	13 47	0 097	1 068	1 157	12 62	0 057	0 636	0 694	11 57
4232 887	0 132	1 441	1 555	13 33	0 096	1 054	1 143	12 37	0 056	0 625	0 683	11 39
4233 328	0 131	1 431	1 545	13 25	0 096	1 054	1 143	12 37	0 058	0 645	0 703	11 73
4257 815	0 133	1 443	1 557	13 35	0 097	1 058	1 147	12 51	0 057	0 628	0 686	11 44
4258 477	0 134	1 453	1 567	13 44	0 098	1 068	1 157	12 62	0 057	0 628	0 686	11 44
4265 418	0 134	1 438	1 552	13 30	0 097	1 052	1 141	12 45	0 058	0 637	0 695	11 59
4266 081	0 132	1 428	1 542	13 22	0 098	1 062	1 151	12 56	0 058	0 637	0 695	11 59
4268 915	0 133	1 438	1 552	13 30	0 097	1 052	1 141	12 45	0 058	0 637	0 695	11 59
4276 836	0 134	1 443	1 557	13 35	0 096	1 041	1 130	12 33	0 057	0 627	0 685	11 42
4283 169	0 134	1 441	1 555	13 33	0 096	1 041	1 130	12 33	0 057	0 627	0 685	11 42
4284 838	0 133	1 430	1 544	13 24	0 097	1 050	1 139	12 43	0 058	0 636	0 694	11 57
4287 566	0 134	1 440	1 554	13 32	0 098	1 060	1 149	12 54	0 057	0 626	0 684	11 40
4288 310	0 135	1 450	1 564	13 41	0 098	1 060	1 149	12 54	0 058	0 636	0 694	11 57
4289 525	0 135	1 450	1 564	13 41	0 097	1 050	1 139	12 43	0 059	0 646	0 704	11 75
4290 377	0 135	1 449	1 563	13 40	0 098	1 059	1 148	12 53	0 058	0 636	0 694	11 57
4290 542	0 134	1 439	1 553	13 31	0 097	1 049	1 138	12 43	0 058	0 636	0 694	11 57
4291 630	0 134	1 439	1 553	13 31	0 098	1 059	1 148	12 53	0 058	0 636	0 694	11 57

TABLE 11 —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908—Continued

Plate ω 166 1908, Aug 27, 6^h 45^m G M T Measured by L on T Distance from Limb 1 6 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
		−0 2				
☉	154 1	24 2	25 2	64 8	17 0	1 046
☉−☊	79 6	40 1	40 6	49 4	11 0	1 019
P	−20 1	55 6	55 9	34 1	8 6	1 011
D	7 1	70 8	70 9	19 1	7 5	1 009
Diameter	168 8 mm	78 3	78 4	11 6	7 3	1 008
Factor	1 019	85 8	85 8	4 2	7 1	1 008

λ	$\phi = 4°2$				$\phi = 11°6$				$\phi = 19°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 172	1 892	2 028	14 44	0 168	1 847	1 981	14 36	0 158	1 738	1 867	14 03
4197 257	0 174	1 912	2 048	14 58	0 168	1 847	1 981	14 36	0 158	1 738	1 867	14 03
4203 730	0 173	1 898	2 034	14 48	0 169	1 853	1 987	14 40	0 159	1 745	1 874	14 08
4207 566	0 176	1 930	2 066	14 71	0 169	1 852	1 986	14 39	0 160	1 751	1 880	14 12
4216 136	0 176	1 925	2 061	14 67	0 168	1 837	1 971	14 29	0 160	1 749	1 878	14 10
4220 509	0 178	1 944	2 080	14 81	0 171	1 861	1 995	14 46	0 160	1 748	1 877	14 09
4232 887	0 178	1 936	2 072	14 75	0 169	1 839	1 973	14 30	0 161	1 752	1 881	14 13
4233 328	0 178	1 936	2 072	14 75	0 172	1 869	2 003	14 52	0 162	1 761	1 890	14 20
4257 815	0 179	1 933	2 069	14 73	0 171	1 849	1 983	14 37	0 162	1 750	1 879	14 11
4258 477	0 177	1 913	2 049	14 59	0 173	1 868	2 002	14 51	0 162	1 750	1 879	14 11
4265 418	0 177	1 907	2 043	14 55	0 173	1 863	1 997	14 47	0 161	1 737	1 866	14 02
4266 081	0 178	1 916	2 052	14 62	0 172	1 846	1 980	14 35	0 162	1 747	1 876	14 09
4268 915	0 178	1 916	2 052	14 62	0 172	1 845	1 979	14 34	0 162	1 745	1 874	14 07
4276 836	0 178	1 913	2 049	14 59	0 173	1 854	1 988	14 41	0 161	1 729	1 858	13 96
4283 169	0 177	1 898	2 034	14 48	0 172	1 844	1 978	14 33	0 162	1 738	1 867	14 03
4284 838	0 176	1 886	2 022	14 39	0 171	1 833	1 967	14 26	0 162	1 737	1 866	14 02
4287 566	0 177	1 898	2 034	14 48	0 173	1 853	1 987	14 40	0 162	1 737	1 866	14 02
4288 310	0 179	1 916	2 052	14 61	0 172	1 842	1 976	14 32	0 163	1 747	1 876	14 09
4289 525	0 178	1 906	2 042	14 54	0 174	1 863	1 997	14 47	0 163	1 747	1 876	14 09
4290 377	0 178	1 905	2 041	14 53	0 173	1 851	1 985	14 39	0 162	1 737	1 866	14 02
4290 542	0 179	1 915	2 051	14 60	0 172	1 841	1 975	14 28	0 163	1 747	1 876	14 09
4291 630	0 176	1 885	2 021	14 38	0 173	1 851	1 985	14 39	0 164	1 756	1 885	14 15

λ	$\phi = 34°1$				$\phi = 49°4$				$\phi = 64°8$			
4196 699	0 130	1 434	1 548	13 27	0 096	1 065	1 154	12 59	0 055	0 622	0 680	11 34
4197 257	0 129	1 424	1 538	13 19	0 094	1 045	1 134	12 37	0 054	0 612	0 670	11 17
4203 730	0 132	1 451	1 565	13 42	0 096	1 064	1 153	12 58	0 056	0 628	0 686	11 42
4207 566	0 131	1 441	1 555	13 33	0 098	1 086	1 175	12 82	0 057	0 637	0 695	11 58
4216 136	0 130	1 426	1 540	13 20	0 096	1 060	1 149	12 54	0 057	0 636	0 694	11 57
4220 509	0 134	1 468	1 582	13 57	0 096	1 059	1 148	12 52	0 058	0 646	0 704	11 74
4232 887	0 133	1 451	1 565	13 42	0 097	1 065	1 154	12 59	0 057	0 635	0 693	11 56
4233 328	0 134	1 462	1 576	13 51	0 096	1 055	1 144	12 48	0 056	0 625	0 683	11 38
4257 815	0 134	1 453	1 567	13 44	0 098	1 069	1 158	12 63	0 058	0 638	0 696	11 59
4258 477	0 136	1 474	1 588	13 62	0 098	1 069	1 158	12 63	0 058	0 638	0 696	11 59
4265 418	0 135	1 458	1 572	13 47	0 097	1 053	1 142	12 46	0 057	0 627	0 685	11 40
4266 081	0 134	1 448	1 562	13 38	0 097	1 053	1 142	12 46	0 058	0 637	0 695	11 58
4268 915	0 135	1 458	1 572	13 47	0 098	1 063	1 152	12 57	0 058	0 637	0 695	11 58
4276 836	0 134	1 443	1 557	13 34	0 098	1 062	1 151	12 56	0 057	0 627	0 685	11 40
4283 169	0 134	1 441	1 555	13 33	0 098	1 062	1 151	12 56	0 058	0 637	0 695	11 58
4284 838	0 135	1 451	1 565	13 42	0 098	1 061	1 150	12 55	0 059	0 646	0 704	11 74
4287 566	0 134	1 440	1 554	13 32	0 098	1 061	1 150	12 55	0 057	0 626	0 684	11 39
4288 310	0 134	1 440	1 554	13 32	0 097	1 051	1 140	12 44	0 058	0 636	0 694	11 57
4289 525	0 135	1 450	1 564	13 41	0 098	1 061	1 150	12 55	0 059	0 646	0 704	11 74
4290 377	0 134	1 439	1 553	13 31	0 098	1 060	1 149	12 54	0 057	0 626	0 684	11 39
4290 542	0 134	1 439	1 553	13 31	0 098	1 060	1 149	12 54	0 058	0 636	0 694	11 57
4291 630	0 135	1 449	1 563	13 40	0 099	1,070	1 159	12 65	0 058	0 636	0 694	11 57

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plates ω 179 and ω 180 1908, Sept 30, 11^{h} 40^{m} G M T Measured by L on T Distance from Limb 1 0 mm Quality, good

		$p-P$	π	ϕ	η	sec η		
	°	°	°	°	°			
O	187 4	29 2	29 9	60 1	13 5	1 028	D	6 7
O−Ω	112 9						Diameter	170 6 mm
P	−26 2						Factor	1 012

λ	$\phi = 60°1$				$\phi = 60°1$				$\phi = 60°1$				$\phi = 60°1$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 070	0 779	0 852	12 14	0 070	0 779	0 852	12 14	0 064	0 718	0 791	11 27	0 065	0 728	0 801	11 41
4197 257	0 070	0 779	0 852	12 14	0 070	0 779	0 852	12 14	0 065	0 728	0 801	11 41	0 065	0 728	0 801	11 41
4203 730	0 070	0 778	0 851	12 12	0 070	0 779	0 852	12 14	0 065	0 726	0 799	11 38	0 065	0 727	0 800	11 40
4207 566	0 072	0 797	0 870	12 39	0 071	0 787	0 860	12 25	0 065	0 725	0 798	11 37	0 066	0 735	0 808	11 51
4216 136	0 071	0 786	0 859	12 24	0 070	0 776	0 849	12 09	0 064	0 714	0 787	11 21	0 065	0 723	0 796	11 34
4220 509	0 072	0 795	0 868	12 36	0 072	0 795	0 868	12 37	0 066	0 732	0 805	11 47	0 067	0 741	0 814	11 59
4232 887	0 072	0 793	0 866	12 33	0 072	0 794	0 867	12 35	0 065	0 720	0 793	11 29	0 065	0 720	0 793	11 29
4233 328	0 072	0 793	0 866	12 33	0 073	0 803	0 876	12 48	0 066	0 730	0 803	11 44	0 066	0 730	0 803	11 44
4257 815	0 074	0 808	0 881	12 55	0 074	0 808	0 881	12 55	0 068	0 746	0 819	11 67	0 067	0 735	0 808	11 51
4258 477	0 072	0 788	0 861	12 26	0 072	0 788	0 861	12 26	0 067	0 736	0 809	11 52	0 067	0 735	0 808	11 51
4265 418	0 072	0 787	0 860	12 25	0 073	0 798	0 871	12 40	0 068	0 744	0 817	11 64	0 067	0 734	0 807	11 49
4266 081	0 073	0 797	0 870	12 39	0 074	0 808	0 881	12 55	0 068	0 744	0 817	11 64	0 069	0 754	0 827	11 78
4268 915	0 072	0 787	0 860	12 25	0 074	0 807	0 880	12 53	0 068	0 744	0 817	11 64	0 067	0 734	0 807	11 49
4276 836	0 074	0 805	0 878	12 51	0 074	0 806	0 879	12 52	0 067	0 733	0 806	11 48	0 068	0 743	0 816	11 62
4283 169	0 072	0 783	0 856	12 19	0 073	0 794	0 867	12 35	0 067	0 732	0 805	11 47	0 067	0 733	0 806	11 48
4284 838	0 072	0 783	0 856	12 19	0 074	0 804	0 877	12 49	0 068	0 742	0 815	11 61	0 067	0 733	0 806	11 48
4287 566	0 073	0 792	0 865	12 35	0 074	0 803	0 876	12 48	0 068	0 742	0 815	11 61	0 068	0 742	0 815	11 61
4288 310	0 074	0 802	0 875	12 47	0 073	0 793	0 866	12 34	0 068	0 742	0 815	11 61	0 067	0 732	0 805	11 47
4289 525	0 074	0 802	0 875	12 47	0 074	0 803	0 876	12 48	0 069	0 752	0 825	11 75	0 068	0 742	0 815	11 61
4290 377	0 073	0 792	0 865	12 32	0 072	0 783	0 856	12 20	0 068	0 742	0 815	11 61	0 067	0 732	0 805	11 47
4290 542	0 073	0 792	0 865	12 32	0 073	0 793	0 866	12 34	0 067	0 730	0 803	11 44	0 069	0 752	0 825	11 75
4291 630	0 074	0 802	0 875	12 47	0 073	0 793	0 866	12 34	0 068	0 740	0 813	11 59	0 071	0 772	0 845	12 04

Plate ω 182 1908, Oct 9, 11^{h} 0^{m} G M T Measured by L on T Distance from Limb 1 0 mm Quality, good

		$p-P$	π	ϕ	η	sec η		
	°	°	°	°	°			
		−0 1						
O	196 2	55 9	56 1	33 9	7 4	1 008	D	6 1
O−Ω	121 7	70 9	71 0	19 0	6 5	1 006	Diameter	172 6 mm
P	−26 5	78 9	79 0	11 0	6 3	1 006	Factor	1 012

λ	$\phi = 11°0$				$\phi = 11°0$				$\phi = 19°0$				$\phi = 33°9$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 169	1 843	1 981	14 33	0 169	1 843	1 981	14 33	0 157	1 711	1 845	13 85	0 125	1 365	1 485	12 70
4197 257	0 170	1 852	1 990	14 39	0 170	1 852	1 990	14 39	0 158	1 721	1 855	13 93	0 125	1 365	1 485	12 70
4203 730	0 171	1 861	1 999	14 46	0 172	1 872	2 009	14 53	0 157	1 705	1 839	13 81	0 127	1 384	1 504	12 86
4207 566	0 172	1 869	2 007	14 52	0 172	1 865	2 002	14 48	0 160	1 731	1 865	14 00	0 127	1 382	1 502	12 85
4216 136	0 172	1 860	1 998	14 45	0 171	1 852	1 990	14 39	0 159	1 718	1 852	13 91	0 126	1 367	1 487	12 72
4220 509	0 172	1 858	1 996	14 44	0 172	1 856	1 994	14 42	0 160	1 725	1 860	13 97	0 126	1 366	1 486	12 71
4232 887	0 173	1 865	2 003	14 49	0 173	1 863	2 001	14 47	0 160	1 724	1 859	13 96	0 128	1 381	1 501	12 84
4233 328	0 173	1 865	2 003	14 49	0 172	1 853	1 991	14 40	0 161	1 734	1 868	14 03	0 126	1 360	1 480	12 66
4257 815	0 175	1 874	2 012	14 55	0 172	1 843	1 981	14 33	0 160	1 712	1 846	13 86	0 128	1 372	1 492	12 77
4258 477	0 174	1 863	2 001	14 47	0 174	1 862	2 000	14 46	0 160	1 712	1 846	13 86	0 127	1 362	1 482	12 68
4265 418	0 174	1 859	1 997	14 44	0 173	1 848	1 986	14 36	0 159	1 697	1 831	13 75	0 127	1 361	1 481	12 67
4266 081	0 174	1 859	1 997	14 44	0 174	1 859	1 997	14 44	0 161	1 715	1 849	13 88	0 129	1 380	1 500	12 83
4268 915	0 174	1 855	1 993	14 41	0 174	1 856	1 994	14 42	0 161	1 714	1 848	13 88	0 126	1 347	1 467	12 55
4276 836	0 173	1 843	1 981	14 33	0 173	1 843	1 981	14 33	0 159	1 693	1 827	13 72	0 126	1 345	1 465	12 53
4283 169	0 173	1 838	1 976	14 29	0 174	1 848	1 986	14 36	0 159	1 689	1 823	13 69	0 127	1 352	1 472	12 59
4284 838	0 174	1 848	1 986	14 36	0 173	1 837	1 975	14 28	0 160	1 699	1 833	13 76	0 127	1 352	1 472	12 59
4287 566	0 174	1 847	1 985	14 35	0 175	1 857	1 995	14 42	0 160	1 698	1 832	13 76	0 127	1 351	1 471	12 58
4288 310	0 174	1 847	1 985	14 35	0 174	1 847	1 985	14 35	0 160	1 698	1 832	13 76	0 127	1 351	1 471	12 58
4289 525	0 173	1 836	1 974	14 28	0 175	1 856	1 994	14 41	0 160	1 698	1 832	13 76	0 128	1 361	1 481	12 67
4290 377	0 173	1 836	1 974	14 28	0 175	1 856	1 994	14 41	0 159	1 688	1 822	13 68	0 128	1 361	1 481	12 67
4290 542	0 174	1 846	1 984	14 35	0 175	1 856	1 994	14 41	0 159	1 688	1 822	13 68	0 128	1 361	1 481	12 67
4291 630	0 172	1 825	1 963	14 20	0 175	1 856	1 994	14 41	0 157	1 718	1 852	13 91	0 128	1 361	1 481	12 67

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 183 1908, Oct 9, 11^{h} 0^{m} G M T Measured by L on T Distance from Limb 1 0 mm Quality, good

	°	$p-P$	π	ϕ	η	sec η
		°	°	°	°	
		−0 1				
☉	196 2	55 9	56 1	33 9	7 4	1.008
☉−Ω	121 7	70 9	71 0	19 0	6 5	1 006
P	−26 5	78 9	79 0	11 0	6 3	1 006
D	6 1					
Diameter	172 6 mm					
Factor	1 012					

λ	ϕ = 11°0				ϕ = 11°0				ϕ = 19°0				ϕ = 19°0			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 170	1 851	1 989	14 38	0 170	1 851	1 989	14 38	0 158	1 722	1 856	13 94	0 158	1 722	1 856	13 94
4197 257	0 169	1 841	1 979	14 31	0 170	1 851	1 989	14 38	0 158	1 722	1 856	13 94	0 158	1 722	1 856	13 94
4203 730	0 172	1 870	2 008	14 52	0 173	1 878	2 016	14 58	0 160	1 741	1 875	14 08	0 159	1 729	1 863	13 99
4207 566	0 171	1 854	1 992	14 41	0 171	1 854	1 992	14 41	0 161	1 749	1 883	14 14	0 160	1 738	1 872	14 06
4216 136	0 171	1 851	1 989	14 38	0 171	1 851	1 989	14 38	0 159	1 726	1 860	13 97	0 160	1 734	1 868	14 03
4220 509	0 172	1 855	1 993	14 41	0 174	1 878	2 016	14 58	0 160	1 734	1 868	14 03	0 160	1 732	1 866	14 01
4232 887	0 171	1 842	1 980	14 32	0 174	1 875	2 013	14 56	0 162	1 745	1 879	14 11	0 160	1 725	1 859	13 96
4233 328	0 172	1 852	1 990	14 39	0 173	1 864	2 002	14 48	0 161	1 735	1 869	14 03	0 161	1 735	1 869	14 03
4257 815	0 174	1 862	2 000	14 46	0 174	1 861	1 999	14 46	0 164	1 755	1 889	14 18	0 162	1 734	1 868	14 02
4258 477	0 174	1 861	1 999	14 46	0 174	1 861	1 999	14 46	0 161	1 724	1 858	13 95	0 161	1 724	1 858	13 95
4265 418	0 174	1 857	1 995	14 43	0 174	1 857	1 995	14 43	0 161	1 721	1 855	13 93	0 161	1 724	1 858	13 95
4266 081	0 175	1 867	2 005	14 50	0 173	1 846	1 984	14 45	0 162	1 730	1 864	14 00	0 162	1 734	1 868	14 02
4268 915	0 174	1 855	1 993	14 41	0 174	1 855	1 993	14 41	0 162	1 729	1 863	13 99	0 162	1 729	1 863	13 99
4276 836	0 174	1 862	2 000	14 46	0 175	1 863	2 001	14 47	0 162	1 726	1 860	13 97	0 161	1 716	1 850	13 90
4283 169	0 174	1 848	1 986	14 37	0 176	1 867	2 005	14 50	0 163	1 731	1 865	14 00	0 162	1 721	1 855	13 93
4284 838	0 174	1 847	1 985	14 36	0 175	1 857	1 995	14 43	0 162	1 721	1 855	13 93	0 162	1 721	1 855	13 93
4287 566	0 174	1 846	1 984	14 35	0 175	1 856	1 994	14 42	0 163	1 731	1 865	14 00	0 161	1 710	1 844	13 85
4288 310	0 174	1 846	1 984	14 35	0 174	1 846	1 984	14 35	0 162	1 720	1 854	13 92	0 162	1 720	1 854	13 92
4289 525	0 175	1 855	1 993	14 41	0 175	1 855	1 993	14 41	0 162	1 719	1 853	13 91	0 162	1 719	1 853	13 92
4290 377	0 173	1 835	1 973	14 27	0 175	1 855	1 993	14 41	0 162	1 719	1 853	13 91	0 161	1 709	1 843	13 84
4290 542	0 175	1 855	1 993	14 41	0 176	1 865	2 003	14 48	0 164	1 739	1 873	14 06	0 162	1 719	1 853	13 91
4291 630	0 175	1 855	1 993	14 41	0 715	1 855	1 993	14 41	0 162	1 719	1 853	13 91	0 162	1 719	1 853	13 91

λ	ϕ = 19°0				ϕ = 33°9				ϕ = 33°9				ϕ = 33°9			
4196 699	0 159	1 732	1 866	14 01	0 131	1 431	1 551	13 27	0 130	1 420	1 540	13 17	0 129	1 411	1 531	13 10
4197 257	0 159	1 732	1 866	14 01	0 131	1 431	1 551	13 27	0 130	1 420	1 540	13 17	0 130	1 420	1 540	13 17
4203 730	0 160	1 741	1 875	14 08	0 132	1 439	1 559	13 33	0 132	1 438	1 558	13 33	0 131	1 428	1 548	13 24
4207 566	0 160	1 738	1 872	14 06	0 132	1 437	1 557	13 32	0 132	1 437	1 557	13 32	0 131	1 425	1 545	13 22
4216 136	0 160	1 735	1 869	14 03	0 131	1 419	1 539	13 16	0 130	1 416	1 536	13 14	0 131	1 423	1 543	13 20
4220 509	0 160	1 732	1 866	14 01	0 131	1 418	1 538	13 16	0 132	1 432	1 552	13 28	0 132	1 432	1 552	13 28
4232 887	0 161	1 736	1 870	14 04	0 132	1 426	1 546	13 22	0 134	1 446	1 566	13 39	0 132	1 429	1 549	13 25
4233 328	0 160	1 724	1 858	13 95	0 132	1 426	1 546	13 22	0 133	1 436	1 556	13 31	0 134	1 447	1 567	13 40
4257 815	0 161	1 724	1 858	13 95	0 135	1 449	1 569	13 42	0 135	1 449	1 569	13 41	0 134	1 437	1 557	13 32
4258 477	0 162	1 734	1 868	14 03	0 134	1 438	1 558	13 33	0 134	1 438	1 558	13 33	0 132	1 417	1 537	13 15
4265 418	0 161	1 721	1 855	13 93	0 132	1 413	1 533	13 11	0 133	1 424	1 544	13 21	0 133	1 424	1 544	13 21
4266 081	0 162	1 731	1 865	14 00	0 133	1 423	1 543	13 20	0 134	1 434	1 554	13 29	0 133	1 424	1 544	13 21
4268 915	0 162	1 727	1 861	13 97	0 134	1 432	1 552	13 28	0 135	1 444	1 564	13 38	0 134	1 432	1 552	13 27
4276 836	0 116	1 715	1 849	13 89	0 134	1 431	1 551	13 27	0 134	1 431	1 551	13 27	0 133	1 420	1 540	13 17
4283 169	0 126	1 721	1 855	13 93	0 134	1 427	1 547	13 23	0 134	1 426	1 546	13 22	0 133	1 417	1 537	13 15
4284 838	0 161	1 711	1 845	13 85	0 134	1 427	1 547	13 23	0 134	1 426	1 546	13 22	0 132	1 407	1 527	13 06
4287 566	0 161	1 711	1 845	13 85	0 134	1 426	1 546	13 22	0 133	1 415	1 535	13 13	0 134	1 429	1 549	13 25
4288 310	0.162	1 720	1 854	13 92	0 134	1 425	1 545	13 22	0 133	1 415	1 535	13 13	0 133	1 419	1 539	13 16
4289 525	0 162	1 719	1 853	13 91	0 135	1 435	1 555	13 30	0 133	1 415	1 535	13 13	0 134	1 429	1 549	13 25
4290 377	0 161	1 709	1 843	13 84	0 135	1 435	1 555	13 30	0 135	1 435	1 555	13 30	0 133	1 419	1 539	13 16
4290 542	0 162	1 719	1 853	13 91	0 134	1 425	1 545	13 22	0 135	1 435	1 555	13 30	0 134	1 429	1 549	13 25
4291 630	0 163	1 729	1 863	13 99	0 135	1 435	1 555	13 30	0 134	1 425	1 545	13 22	0 136	1 446	1 566	13 39

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 184 1908, Oct 22, 6h 30m G M T Measured by L on T Distance from Limb 1 3 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	209 0	24 0	24 5	65 5	12 5	1 024
O−Ω	134 5	29 3	29 7	60 3	10 5	1 017
P	−25 9	39 7	40 0	50 0	8 1	1 010
D	5 1	86 0	86 0	4 0	5 2	1 004

Diameter 171 2 mm
Factor 1 015

λ	$\phi = 4°0$				$\phi = 50°0$				$\phi = 50°0$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 176	1 920	2 060	14 66	0 092	1 010	1 109	12 25	0 093	1 020	1 119	12 36
4197 257	0 176	1 920	2 060	14 66	0 092	1 010	1 109	12 25	0 093	1 020	1 119	12 36
4203 730	0 176	1 915	2 055	14 62	0 093	1 017	1 116	12 33	0 094	1 030	1 129	12 47
4207 566	0 177	1 924	2 064	14 69	0 093	1 015	1 114	12 30	0 094	1 028	1 127	12 45
4216 136	0 177	1 919	2 059	14 65	0 092	1 004	1 103	12 18	0 094	1 023	1 122	12 39
4220 509	0 178	1 928	2 068	14 72	0 094	1 023	1 122	12 39	0 095	1 032	1 131	12 49
4232 887	0 178	1 921	2 061	14 67	0 094	1 020	1 119	12 36	0 094	1 020	1 119	12 36
4233 328	0 180	1 941	2 081	14 81	0 095	1 030	1 129	12 47	0 095	1 030	1 129	12 47
4257 815	0 180	1 928	2 068	14 72	0 094	1 013	1 112	12 28	0 097	1 043	1 142	12 61
4258 477	0 179	1 918	2 058	14 65	0 095	1 023	1 122	12 39	0 095	1 022	1 121	12 38
4265 418	0 179	1 914	2 054	14 62	0 094	1 012	1 111	12 27	0 094	1 011	1 110	12 26
4266 081	0 181	1 934	2 074	14 76	0 096	1 032	1 131	12 49	0 095	1 021	1 120	12 37
4268 915	0 180	1 921	2 061	14 67	0 094	1 009	1 108	12 24	0 096	1 030	1 129	12 47
4276 836	0 180	1 919	2 059	14 65	0 094	1 008	1 107	12 23	0 096	1 029	1 128	12 46
4283 169	0 180	1 913	2 053	14 61	0 095	1 016	1 115	12 32	0 097	1 036	1 135	12 54
4284 838	0 180	1 913	2 053	14 61	0 095	1 016	1 115	12 32	0 097	1 036	1 135	12 54
4287 566	0 180	1 912	2 052	14 60	0 094	1 005	1 104	12 19	0 096	1 026	1 125	12 43
4288 310	0 179	1 902	2 042	14 53	0 095	1 015	1 114	12 30	0 097	1 036	1 135	12 54
4289 525	0 180	1 912	2 052	14 60	0 097	1 036	1 135	12 54	0 098	1 046	1 145	12 65
4290 377	0 180	1 912	2 052	14 60	0 094	1 005	1 104	12 19	0 096	1 025	1 124	12 41
4290 542	0 180	1 912	2 052	14 60	0 095	1 015	1 114	12 30	0 098	1 046	1 145	12 65
4291 630	0 181	1 922	2 062	14 67	0 095	1 015	1 114	12 30	0 097	1 035	1 134	12 52

λ	$\phi = 60°3$				$\phi = 60°3$				$\phi = 65°5$				$\phi = 65°5$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°		km	km	°
4196 699	0 065	0 719	0 799	11 45	0 066	0 729	0 809	11 59	0 053	0 589	0 657	11 25	0 053	0 588	0 656	11 23
4197 257	0 066	0 729	0 809	11 59	0 066	0 729	0 809	11 59	0 054	0 600	0 668	11 44	0 053	0 588	0 656	11 23
4203 730	0 068	0 750	0 830	11 89	0 067	0 739	0 819	11 74	0 053	0 588	0 656	11 57	0 054	0 598	0 666	11 40
4207 566	0 068	0 749	0 829	11 88	0 067	0 739	0 819	11 74	0 054	0 598	0 666	11 40	0 054	0 597	0 665	11 38
4216 136	0 067	0 738	0 818	11 72	0 066	0 728	0 808	11 58	0 053	0 586	0 654	11 20	0 053	0 585	0 653	11 18
4220 509	0 068	0 746	0 826	11 84	0 068	0 746	0 826	11 84	0 053	0 584	0 652	11 16	0 053	0 584	0 652	11 16
4232 887	0 069	0 754	0 834	11 95	0 067	0 734	0 814	11 66	0 055	0 605	0 673	11 52	0 053	0 583	0 651	11 14
4233 328	0 068	0 744	0 824	11 81	0 070	0 764	0 844	12 09	0 054	0 593	0 661	11 32	0 054	0 593	0 661	11 32
4257 815	0 068	0 739	0 819	11 74	0 070	0 758	0 838	12 01	0 055	0 600	0 668	11 44	0 055	0 601	0 669	11 45
4258 477	0 068	0 739	0 819	11 74	0 069	0 748	0 828	11 86	0 055	0 600	0 668	11 44	0 055	0 601	0 669	11 45
4265 418	0 069	0 748	0 828	11 86	0 070	0 758	0 838	12 01	0 053	0 578	0 646	11 06	0 055	0 600	0 668	11 44
4266 081	0 069	0 748	0 828	11 86	0 069	0 748	0 828	11 86	0 057	0 622	0 690	11 81	0 056	0 610	0 678	11 61
4268 915	0 069	0 746	0 826	11 84	0 070	0 757	0 837	11 99	0 056	0 610	0 678	11 61	0 056	0 609	0 677	11 59
4276 836	0 068	0 734	0 814	11 86	0 071	0 766	0 846	12 12	0 056	0 609	0 677	11 59	0 054	0 587	0 655	11 21
4283 169	0 069	0 743	0 823	11 79	0 068	0 733	0 813	11 65	0 056	0 607	0 675	11 56	0 054	0 586	0 654	11 20
4284 838	0 070	0 754	0 834	11 95	0 069	0 743	0 823	11 79	0 055	0 597	0 665	11 61	0 054	0 586	0 654	11 54
4287 566	0 068	0 734	0 814	11 66	0 069	0 743	0 823	11 79	0 055	0 596	0 664	11 37	0 055	0 596	0 664	11 54
4288 310	0 067	0 723	0 803	11 51	0 070	0 753	0 833	11 94	0 056	0 606	0 674	11 54	0 055	0 596	0 664	11 37
4289 525	0 070	0 753	0 833	11 94	0 070	0 753	0 833	11 94	0 056	0 606	0 674	11 54	0 057	0 617	0 685	11 73
4290 377	0 070	0 753	0 833	11 94	0 069	0 742	0 822	11 78	0 056	0 606	0 674	11 54	0 054	0 585	0 653	11 18
4290 542	0 070	0 753	0 833	11 94	0 071	0 763	0 843	12 08	0 057	0 616	0 684	11 71	0 056	0 606	0 674	11 54
4291 630	0 069	0 743	0 823	11 79	0 070	0 753	0 833	11 94	0 056	0 606	0 674	11 54	0 055	0 595	0 663	11 35

TABLE II —RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908—Continued

Plate ω 185 1908, Oct 22, $6^h 30^m$ G M T Measured by L on T Distance from Limb 1 3 mm Quality, good

	°	$p-P$	π	ϕ	η	sec η
		°	°	°	°	
		0 0				
O	209 0	24 0	24 5	65 5	12 5	1 024
O−Ω	134 5	39 7	40 0	50 0	8 1	1 010
P	−25 9	86 0	86 0	4 0	5 2	1 004
D	5 1					
Diameter	171 2 mm					
Factor	1 015					

λ	$\phi = 4°0$				$\phi = 50°0$				$\phi = 50°0$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 176	1 920	2 060	14 66	0 091	0 999	1 098	12 13	0 091	0 999	1 098	12 13
4197 257	0 176	1 920	2 060	14 66	0 091	0 999	1 098	12 13	0 091	0 999	1 098	12 13
4203 730	0 177	1 926	2 066	14 70	0 092	1 008	1 107	12 23	0 092	1 008	1 107	12 23
4207 566	0 177	1 924	2 064	14 69	0 092	1 006	1 105	12 21	0 092	1 007	1 106	12 22
4216 136	0 177	1 921	2 061	14 67	0 092	1 004	1 103	12 18	0 092	1 005	1 104	12.19
4220 509	0 178	1 928	2 068	14 72	0 093	1 011	1 110	12 26	0 092	1 003	1 102	12 17
4232 887	0 178	1 921	2 061	14 67	0 092	0 999	1 098	12 13	0 094	1 015	1 114	12 30
4233 328	0 180	1 941	2 081	14 81	0 093	1 009	1 108	12 24	0 094	1 015	1 114	12 30
4257 815	0 180	1 929	2 069	14 72	0 094	1 013	1 112	12 28	0 093	1 003	1 102	12 17
4258 477	0 180	1 928	2 068	14 72	0 092	0 992	1 091	12 05	0 093	1 003	1 102	12 17
4265 418	0 179	1 914	2 054	14 62	0 094	1 010	1 109	12 25	0 094	1 010	1 109	12 25
4266 081	0 181	1 934	2 074	14 76	0 093	1 000	1 099	12 14	0 093	1 000	1 099	12 14
4268 915	0 179	1 911	2 051	14 60	0 094	1 009	1 108	12 24	0 094	1 010	1 109	12 25
4276 836	0 180	1 919	2 059	14 65	0 093	0 998	1 097	12 12	0 094	1 008	1 107	12 23
4283 169	0 180	1 914	2 054	14 62	0 094	1 006	1 105	12 21	0 094	1 006	1 105	12 21
4284 838	0 180	1 914	2 054	14 62	0 093	0 996	1 095	12 10	0 094	1 006	1 105	12 21
4287 566	0 180	1 913	2 053	14 61	0 094	1 005	1 104	12 19	0 093	0 995	1 094	12 08
4288 310	0 181	1 923	2 063	14 68	0 095	1 015	1 114	12 30	0 093	0 995	1 094	12 08
4289 525	0 180	1 912	2 052	14 60	0 093	0 995	1 094	12 08	0 095	1 015	1 114	12 30
4290 377	0 179	1 902	2 042	14 53	0 094	1 005	1 104	12 19	0 094	1 005	1 104	12 19
4290 542	0 180	1 912	2 052	14 60	0 094	1 004	1 103	12 18	0 094	1 005	1 104	12.19
4291 630	0 181	1 922	2 062	14 67	0 094	1 004	1 103	12 18	0 096	1 025	1 124	12 41
	$\phi = 65°5$				$\phi = 65°5$							
4196 699	0 051	0 567	0 635	10 87	0 050	0 559	0 627	10 73				
4197 257	0 051	0 567	0 635	10 87	0 051	0 570	0 638	10 92				
4203 730	0 052	0 577	0 645	11 04	0 052	0 579	0 647	11 08				
4207 566	0 051	0 566	0 634	10 85	0 052	0 577	0 645	11 04				
4216 136	0 052	0 576	0 644	11 03	0 051	0 564	0 632	10 82				
4220 509	0 052	0 575	0 643	11 01	0 052	0 575	0 643	11 01				
4232 887	0 054	0 593	0 661	11 32	0 052	0 573	0 641	10 97				
4233 328	0 054	0 593	0 661	11 32	0 054	0 593	0 661	11 32				
4257 815	0 054	0 590	0 658	11 26	0 053	0 580	0 648	11 09				
4258 477	0 054	0 590	0 658	11 26	0 052	0 569	0 637	10 90				
4265 418	0 053	0 579	0 647	11 08	0 054	0 589	0 657	11 25				
4266 081	0 055	0 600	0 668	11 44	0 055	0 600	0 668	11 44				
4268 915	0 055	0 599	0 667	11 42	0 055	0 599	0.667	11 42				
4276 836	0 054	0 588	0 656	11 23	0 054	0 587	0 655	11 21				
4283 169	0 054	0 587	0 655	11 21	0 054	0 586	0 654	11 20				
4284 838	0 054	0 587	0 655	11 21	0 053	0 576	0 644	11 02				
4287 566	0 054	0 586	0 654	11 20	0 053	0 575	0 643	11 01				
4288 310	0 055	0 596	0 664	11 47	0 053	0 575	0 643	11 01				
4289 525	0 054	0 586	0 654	11 20	0 053	0 575	0 643	11 01				
4290 377	0 053	0 576	0 644	11 02	0 053	0 575	0,643	11 01				
4290 542	0 054	0 586	0 654	11 20	0 053	0 575	0 643	11 01				
4291 630	0 054	0 586	0 654	11 20	0 054	0 585	0 653	11 18				

TABLE II — RESULTS FOR INDIVIDUAL PLATES OBSERVATIONS OF 1908 — Continued

Plate ω 186 1908, Oct 22, $7^h\ 45^m$ G M T Measured by L on T Distance from Limb 1 0 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
C	209 0	24 0	24 5	65 5	12 5	1 024
O−Ω	134 5	39 7	40 0	50 0	8 1	1 010
P	−25 9	86 0	86 0	4 0	5 2	1 004
D	5 1					
Diameter	171 2 mm					
Factor	1 012					

λ	$\phi = 4°0$				$\phi = 4°0$				$\phi = 50°0$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4196 699	0 176	1 920	2 060	14 66	0 176	1 920	2 060	14 66	0 091	1 000	1 099	12 14
4197 257	0 176	1 920	2 060	14 66	0 176	1 920	2 060	14 66	0 092	1 010	1 109	12 25
4203 730	0 177	1 926	2 066	14 70	0 176	1 915	2 055	14 62	0 092	1 010	1 109	12 25
4207 566	0 177	1 924	2 064	14 69	0 177	1 921	2 061	14 67	0 091	0 997	1 096	12 10
4216 136	0 177	1 921	2 061	14 67	0 176	1 909	2 049	14 58	0 093	1 015	1 114	12 30
4220 509	0 178	1 928	2 068	14 72	0 177	1 917	2 057	14 64	0 094	1 021	1 120	12 37
4232 887	0 178	1 919	2 059	14 65	0 178	1 920	2 060	14 66	0 093	1 009	1 108	12 24
4233 328	0 177	1 909	2 049	14 58	0 178	1 920	2 060	14 66	0 093	1 009	1 108	12 24
4257 815	0 179	1 918	2 058	14 65	0 181	1 938	2 078	14 79	0 093	1 002	1 101	12 16
4258 477	0 179	1 918	2 058	14 65	0 180	1 928	2 068	14 72	0 093	1 002	1 101	12 16
4265 418	0 178	1 901	2 041	14 52	0 181	1 922	2 062	14 67	0 093	1 000	1 099	12 14
4266 081	0 180	1 921	2 061	14 67	0 182	1 942	2 082	14 82	0 094	1 010	1 109	12 25
4268 915	0 180	1 920	2 060	14 66	0 180	1 921	2 061	14 67	0 094	1 009	1 108	12 24
4276 836	0 178	1 898	2 038	14 51	0 179	1 909	2 049	14 58	0 093	0 998	1 097	12 12
4283 169	0 180	1 916	2 056	14 63	0 182	1 936	2 076	14 77	0 094	1 005	1 104	12 19
4284 838	0 180	1 916	2 056	14 63	0 180	1 915	2 055	14 62	0 093	0 995	1 094	12 08
4287 566	0 179	1 906	2 046	14 56	0 180	1 914	2 054	14 62	0 094	1 005	1 104	12 19
4288 310	0 181	1 925	2 065	14 69	0 180	1 913	2 053	14 61	0 092	0 984	1 083	11 96
4289 525	0 179	1 904	2 044	14 55	0 182	1 933	2 073	14 75	0 093	0 994	1 093	12 07
4290 377	0 180	1 913	2 053	14 61	0 181	1 922	2 062	14 67	0 093	0 994	1 093	12 07
4290 542	0 180	1 912	2 052	14 60	0 182	1 932	2 072	14 74	0 094	1 004	1 103	12 18
4291 630	0 182	1 932	2 072	14 74	0 182	1 932	2 072	14 74	0 093	0 994	1 093	12 07
	$\phi = 65°5$				$\phi = 65°5$							
4196 699	0 052	0 580	0 648	11 09	0 050	0 556	0 624	10 68				
4197 257	0 053	0 590	0 658	11 26	0 050	0 556	0 624	10 68				
4203 730	0 052	0 580	0 648	11 09	0 052	0 577	0 645	11 04				
4207 566	0 052	0 577	0 645	11 04	0 050	0 553	0 621	10 63				
4216 136	0 052	0 575	0 643	11 01	0 049	0 540	0 608	10 41				
4220 509	0 053	0 585	0 653	11 18	0 052	0 574	0 642	10 99				
4232 887	0 052	0 573	0 641	10 97	0 052	0 572	0 640	10 96				
4233 328	0 053	0 583	0 651	11 14	0 052	0 572	0 640	10 96				
4257 815	0 054	0 590	0 658	11 26	0 052	0 566	0 634	10 85				
4258 477	0 053	0 580	0 648	11 09	0 051	0 555	0 623	10 66				
4265 418	0 054	0 589	0 657	11 25	0 051	0 554	0 622	10 65				
4266 081	0 054	0 589	0 657	11 25	0 052	0 565	0 633	10 84				
4268 915	0 054	0 588	0 656	11 23	0 052	0 565	0 633	10 84				
4276 836	0 054	0 587	0 655	11 21	0 052	0 564	0 632	10 82				
4283 169	0 052	0 566	0 634	10 85	0 052	0 562	0 630	10 78				
4284 838	0 054	0 586	0 654	11 20	0 052	0 562	0 630	10 78				
4287 566	0 054	0 585	0 653	11 18	0 050	0 544	0 612	10 48				
4288 310	0 055	0 596	0 664	11 37	0 052	0 562	0 630	10 78				
4289 525	0 053	0 575	0 643	11 01	0 052	0 561	0 629	10 77				
4290 377	0 054	0 585	0 653	11 18	0 051	0 550	0 618	10 58				
4290 542	0 052	0 565	0 633	10 84	0 052	0 561	0 629	10 77				
4291 630	0 053	0 575	0 643	11 01	0 051	0 550	0 618	10 58				

The results for the individual plates are summarized in Tables 12, 13, and 14, which are identical in form with Tables 5, 6, and 7 for the 1906–1907 observations.

TABLE 12 — MEAN RESULTS FOR EACH PLATE FROM ALL LINES OBSERVATIONS OF 1908

PLATE No	DATE	No OF LINES	ϕ	$v + v_1$	ξ
	1908		°	km	°
ω 103	Feb 16	22	−0 2	2 071	14 71
			14 1	1 948	14 26
			29 9	1 635	13 39
			44 8	1 289	12 89
			59 5	0 774	10 83
			73 7	0 439	11 11
ω 105_1	Mar 10	22	−0 3	2 057	14 60
			14 6	1 989	14 59
			29 4	1 634	13 31
			44 2	1 346	13 33
			59 3	0 847	11 77
			74 3	0 419	11 00
ω 105_1	Mar 10	22	−0 3	2 081	14 77
			14 6	1 971	14 47
			29 4	1 662	13 54
			44 2	1 342	13 29
			59 3	0 840	11 68
			74 3	0 401	10 51
ω 105_2	Mar 10	22	−0 4	2 072	14 72
			−0 4	2 070	14 71
			15 2	1 956	14 39
			30 1	1 675	13 75
ω 105_2	Mar 10	22	−0 4	2 080	14 77
			−0 4	2 073	14 72
			15 2	1 966	14 45
			30 1	1 669	13 71
ω 106	Mar 10	22	45 1	1 312	13 20
			60 4	0 792	11 38
			75 1	0 416	11 49
ω 106	Mar 10	22	45 1	1 293	13 01
			60 4	0 747	10 80
			75 1	0 407	11 24
			75 1	0 407	11 24
			60 4	0 797	11 44
			45 1	1 302	13 10
			30 1	1 658	13 61
			15 2	1 971	14 51
ω 113	Apr 8	22	0 0	2 100	14 92
			14 9	1 969	14 46
			29 8	1 679	13 75
			44 8	1 298	12 98
			60 7	0 801	11 62
			75 7	0 360	10 36
ω 113	Apr 8	22	0 0	2 081	14 77
			14 9	1 961	14 41
			29 8	1 682	13 76
			44 8	1 294	12 94
			60 7	0 793	11 52
			75 7	0 363	10 45

PLATE No	DATE	No OF LINES	ϕ	$v + v_1$	ξ
	1908		°	km	°
ω 117_1	May 26	22	−0 6	2 056	14 60
			14 4	1 895	13 89
			29 4	1 664	13 56
			44 6	1 301	12 98
			60 4	0 837	12 03
			75 9	0 372	10 84
ω 117_2	May 26	22	−0 6	2 058	14 61
			14 4	1 898	13 91
			29 4	1 664	13 57
			44 6	1 298	12 95
			60 4	0 845	12 15
			75 9	0 385	11 22
ω 120_1	June 2	22	2 3	2 053	14 58
			12 7	1 959	14 25
			17 3	1 862	13 86
			32 8	1 645	13 89
			48 3	1 175	12 54
			63 8	0 640	10 29
			77 3	0 335	10 82
ω 120_2	June 2	22	4 3	2 042	14 54
			10 7	2 009	14 51
			19 3	1 840	13 86
			34 8	1 610	13 92
			50 3	1 159	13 88
			65 3	0 693	12 04
			79 3	0 259	9 91
ω 128	June 9	22	−0 5	2 057	14 61
			14 5	1 917	14 06
			29.5	1 687	13 76
			44 5	1 260	12 54
			59 5	0 832	11 64
			74 5	0 380	10 12
ω 132	June 10	22	4 4	2 032	14 47
			19 4	1 897	14 28
			34 4	1 593	13 73
			49 4	1 169	12 75
			64 4	0 715	11 75
			79 4	0 262	10 12
ω 134	June 11	22	−0 5	2 043	14 51
			4 5	2 013	14 54
			19 5	1 859	14 00
			34 5	1 557	13 42
			49 5	1 165	12 74
			64 5	0 707	11 66
			79 5	0 262	10 22
ω 135_1	June 11	22	−0 5	2 064	14 66
			14 5	1 940	14 22
			29 5	1 676	13 67
			44 5	1 245	12 39
			59 5	0 772	10 80
			74 5	0 381	10 12
			79 5	0 262	10 22
ω 135_2	June 11	22	−0 5	2 038	14 46
			14 5	1 938	14 21
			29 5	1 681	13 72
			44 5	1 237	12 31
			59 5	0 772	10 79
			74 5	0 384	10 21
			79 5	0 260	10 12

TABLE 12 —MEAN RESULTS FOR EACH PLATE FROM ALL LINES OBSERVATIONS OF 1908 — Continued

PLATE No	DATE	No OF LINES	ϕ	$v+v_1$	ξ
	1908		°	km	°
ω 136	June 11	22	−0 5	2 047	14 53
			4 5	1 981	14 11
			19 5	1 847	13 91
			34 5	1 551	13 36
			49 5	1 158	12 66
			64 5	0 656	10 81
			79 5	0 266	10 36
ω 146	Aug 5	22	0 3	2 028	14 40
			15 2	1 934	14 23
			30 1	1 658	13 60
			45 5	1 265	12 81
			60 7	0 682	10 97
			75 4	0 405	11 35
ω 147	Aug 5	22	0 3	2 052	14 57
			15 2	1 959	14 42
			30 1	1 686	13 85
			45 5	1 269	12 86
			60 7	0 781	11 34
			75 4	0 401	11 30
ω 148	Aug 5	22	0 3	2 056	14 60
			15 2	1 959	14 41
			30 1	1 688	13 85
			35 5	1 265	12 81
			60 7	0 798	11 59
			75 4	0 403	11 36
ω 151	Aug 6	22	−0 3	2 062	14 64
			−0 3	2 060	14 63
			14 6	1 952	14 32
			44 6	1 270	12 66
			59 8	0 809	11 42
			74 9	0 415	11 31
ω 161	Aug 26	22	4 2	2 044	14 55
			10 9	1 989	14 38
			19 1	1 886	14 18
			34 2	1 547	13 27
			49 4	1 080	11 78
			65 0	0 631	10 60
ω 162	Aug 26	22	4 2	2 048	14 57
			10 9	1 986	14 36
			19 1	1 878	14 11
			34 2	1 505	12 91
			49 4	1 144	12 48
			65 0	0 693	11 67
ω 163	Aug 26	22	4 2	2 040	14 52
			10 9	2 002	14 46
			19 1	1 886	14 18
			34 2	1 548	13 29
			49 4	1 149	12 54
			65 0	0 688	11 55
ω 164	Aug 26	22	4 2	2 029	14 44
			10 9	1 995	14 42
			19 1	1 870	14 06
			34 2	1 556	13 36
		20	49 4	1 152	12 56
		20	65 0	0 700	11 76
	1908		°	km	°
ω 165	Aug 27	22	4 2	2 032	14 47
			11 6	1 992	14 43
			19 1	1 880	14 12
			34 1	1 557	13 35
			49 4	1 142	12 46
			64 8	0 688	11 48
ω 166	Aug 27	22	4 2	2 049	14 58
			11 6	1 984	14 38
			19 1	1 874	14 07
			34 1	1 561	13 38
			49 4	1 150	12 55
			64 8	0 691	11 52
ω 179	Sept 30	22	60 1	0 865	12 32
			60 1	0 867	12 35
ω 180	Sept 30	22	60 1	0 808	11 51
			60 1	0 810	11 53
ω 182	Oct 9	22	11 0	1 990	14 39
			11 0	1 992	14 40
			19 0	1 843	13 84
			33 9	1 483	12 69
ω 183	Oct 9	22	11 0	1 991	14 40
			11 0	1 997	14 44
			19 0	1 864	14 00
			19 0	1 858	13 95
			19 0	1 859	13 96
			33 9	1 549	13 25
			33 9	1 550	13 26
			33 9	1 546	13 22
ω 184	Oct 22	22	4 0	2 059	14 65
			50 0	1 115	12 31
			50 0	1 128	12 46
			60 3	0 823	11 79
			60 3	0 827	11 85
			65 5	0 668	11 46
			65 5	0 663	11 37
ω 185	Oct 22	22	4 0	2 060	14 66
			50 0	1 103	12 18
			50 0	1 105	12 21
			65 5	0 652	11 17
			65 5	0 647	11 08
ω 186	Oct 22	22	4 0	2 057	14 64
			4 0	2 063	14 68
			50 0	1 101	12 17
			65 5	0 650	11 14
			65 5	0 628	10 75

TABLE 13 —MEAN RESULTS FOR EACH LATITUDE FROM ALL LINES OBSERVATIONS OF 1908

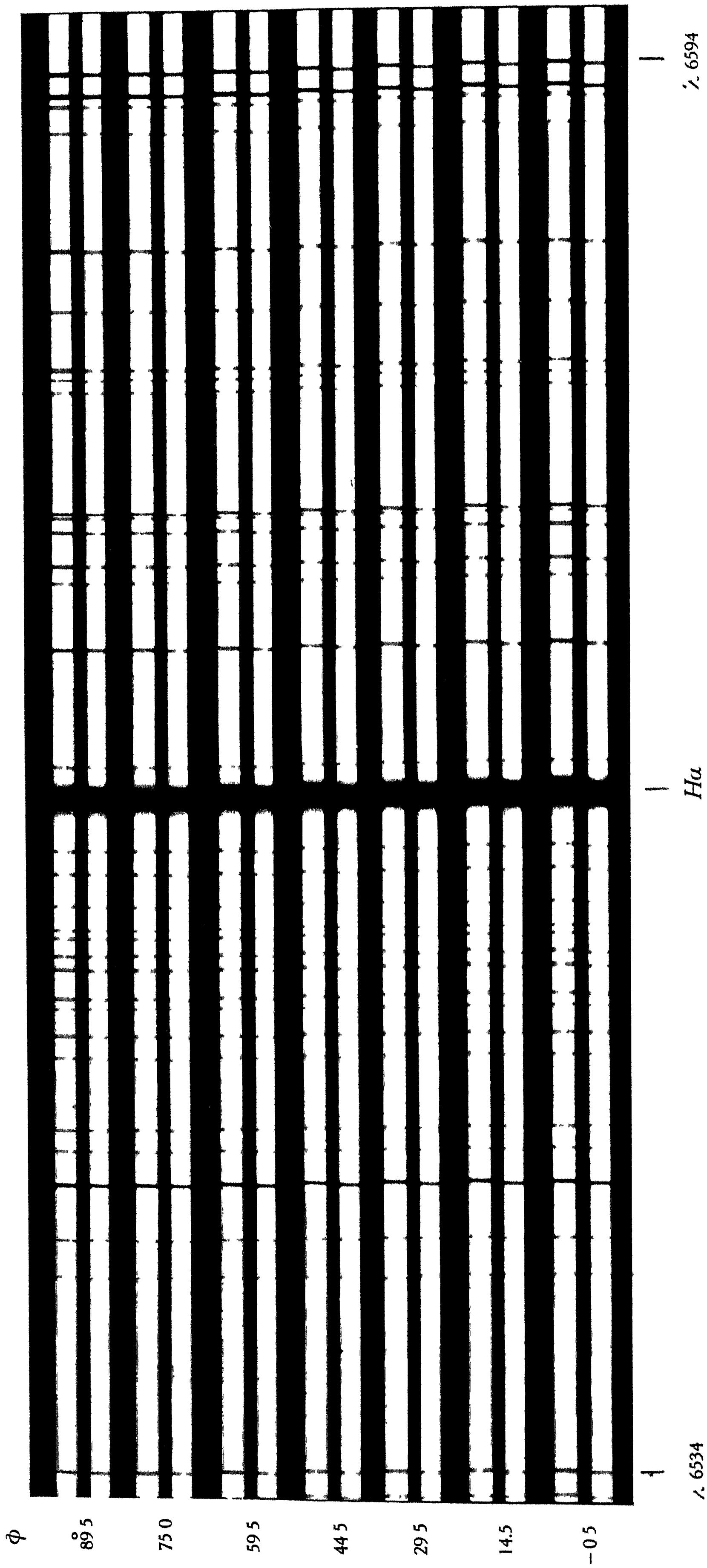
PLATE No	ϕ	$v+v_1$	ξ
	°	km	°
ω 103	0.2	2.071	14.71
105_1	0.3	2.057	14.60
105_1	0.3	2.081	14.77
105_2	0.4	2.072	14.72
105_2	0.4	2.070	14.71
105_2	0.4	2.080	14.77
105_2	0.4	2.073	14.72
113	0.0	2.100	14.92
113_1	0.0	2.081	14.77
117_1	0.6	2.056	14.60
117_2	0.6	2.058	14.61
128	0.5	2.057	14.61
134	0.5	2.043	14.51
135_1	0.5	2.064	14.66
135_2	0.5	2.038	14.46
136	0.5	2.047	14.53
146	0.3	2.028	14.40
147	0.3	2.052	14.57
148	0.3	2.056	14.60
151	0.3	2.062	14.64
151	0.3	2.060	14.63
Means,	0.4	2.062	14.64
ω 120_1	2.3	2.053	14.58
120_2	4.3	2.042	14.54
132	4.4	2.032	14.47
134	4.5	2.013	14.54
136	4.5	1.981	14.11
161	4.2	2.044	14.55
162	4.2	2.048	14.57
163	4.2	2.040	14.52
164	4.2	2.029	14.44
165	4.2	2.032	14.47
166	4.2	2.049	14.58
184	4.0	2.059	14.65
185	4.0	2.060	14.66
186	4.0	2.057	14.64
186	4.0	2.063	14.68
Means,	4.1	2.040	14.53
ω 120_1	12.7	1.959	14.25
120_2	10.7	2.009	14.51
161	10.9	1.989	14.38
162	10.9	1.986	14.36
163	10.9	2.002	14.46
164	10.9	1.995	14.42
165	11.6	1.992	14.43
166	11.6	1.984	14.38
182	11.0	1.990	14.39
182	11.0	1.992	14.40
183	11.0	1.991	14.40
183	11.0	1.997	14.44
Means,	11.2	1.990	14.40
ω 103	14.1	1.948	14.26
105_1	14.6	1.989	14.59
105_1	14.6	1.971	14.47
105_2	15.2	1.956	14.39
105_2	15.2	1.966	14.45
106	15.2	1.971	14.51
113	14.9	1.969	14.46
113	14.9	1.961	14.41
117_1	14.4	1.895	13.89
117_2	14.4	1.898	13.91
120_1	17.3	1.862	13.86
128	14.5	1.917	14.06
135_1	14.5	1.940	14.22
135_2	14.5	1.938	14.21
146	15.2	1.934	14.23
147	15.2	1.959	14.42
148	15.2	1.959	14.42
151	14.6	1.952	14.32
Means,	14.9	1.944	14.28
ω 120_2	19.3	1.840	13.86
132	19.4	1.897	14.28
134	19.5	1.859	14.00
136	19.5	1.847	13.91
161	19.1	1.866	14.18
162	19.1	1.878	14.11
163	19.1	1.886	14.18
164	19.1	1.870	14.06
165	19.1	1.880	14.12
166	19.1	1.874	14.07
182	19.0	1.843	13.84
183	19.0	1.864	14.00
183	19.0	1.858	13.95
183	19.0	1.859	13.96
Means,	19.2	1.867	14.04
ω 103	29.9	1.635	13.39
105_1	29.4	1.634	13.31
105_1	29.4	1.662	13.54
105_2	30.1	1.675	13.75
105_2	30.1	1.669	13.71
106	30.1	1.658	13.61
113	29.8	1.679	13.75
113	29.8	1.682	13.76
117_1	29.4	1.664	13.56
117_2	29.4	1.664	13.57
128	29.5	1.687	13.76
135_1	29.5	1.676	13.67
135_2	29.5	1.681	13.72
146	30.1	1.658	13.60
147	30.1	1.686	13.85
148	30.1	1.688	13.85
Means,	29.8	1.669	13.65
ω 120_1	32.8	1.645	13.89
120_2	34.8	1.610	13.92
132	34.4	1.593	13.73
134	34.5	1.557	13.42
136	34.5	1.551	12.36
161	34.2	1.547	13.27
162	34.2	1.505	12.91
163	34.2	1.548	13.29
164	34.2	1.556	13.36
165	34.1	1.557	13.37
166	34.1	1.561	13.38
182	33.9	1.483	12.69
183	33.9	1.549	13.25
183	33.9	1.550	13.26
183	33.9	1.546	13.22
Means,	34.1	1.557	13.35
ω 103	44.8	1.289	12.89
105_1	44.2	1.346	13.33
105_1	44.2	1.342	13.29
106	45.1	1.312	13.20
106	45.1	1.293	13.01
106	45.1	1.302	13.10
113	44.8	1.298	12.98
113	44.8	1.294	12.94
117_1	44.6	1.301	12.98
117_2	44.6	1.298	12.95
128	44.5	1.260	12.54
135_1	44.5	1.245	12.39
135_2	44.5	1.237	12.31
146	45.5	1.265	12.81
147	45.5	1.269	12.86
148	45.5	1.265	12.81
151	45.6	1.270	12.66
Means,	44.8	1.289	12.88
ω 120_1	48.3	1.175	12.54
120_2	50.3	1.159	12.88
132	49.4	1.169	12.75
134	49.5	1.165	12.74
136	49.5	1.158	12.66
161	49.4	1.080	11.78
162	49.4	1.144	12.48
163	49.4	1.149	12.54
164	49.4	1.152	12.56
165	49.4	1.142	12.46
166	49.4	1.150	12.55
184	50.0	1.115	12.31
184	50.0	1.128	12.46
185	50.0	1.103	12.18
185	50.0	1.105	12.21
186	50.0	1.101	12.17
Means,	49.6	1.137	12.45
ω 103	59.5	0.774	10.83
105_1	59.3	0.847	11.77
105_1	59.3	0.840	11.68
106	60.4	0.792	11.38
106	60.4	0.747	10.80
106	60.4	0.797	11.44
113	60.7	0.801	11.62
113	60.7	0.793	11.52
117_1	60.4	0.837	12.03
117_2	60.4	0.845	12.15
128	59.5	0.832	11.64
135_1	59.5	0.772	10.80
135_2	59.5	0.774	10.79
146	60.7	0.755	10.97
147	60.7	0.781	11.34
148	60.7	0.798	11.59
151	59.8	0.809	11.42
179	60.1	0.866	12.34
180	60.1	0.808	11.51
180	60.1	0.810	11.53
184	60.3	0.823	11.79
184	60.3	0.827	11.85
Means,	60.1	0.801	11.49
ω 120_1	63.8	0.640	10.29
120_2	65.3	0.693	12.04
132	64.4	0.715	11.75
134	64.5	0.707	11.66
136	64.5	0.656	10.81
161	65.0	0.631	10.60
162	65.0	0.693	11.67
163	65.0	0.688	11.55
164	65.0	0.700	11.76
165	64.8	0.688	11.48
166	64.8	0.691	11.52
184	65.5	0.668	11.46
184	65.5	0.663	11.37
185	65.5	0.652	11.17
185	65.5	0.647	11.08
186	65.5	0.650	11.14
186	65.5	0.628	10.75
Means,	65.0	0.671	11.30
ω 103	73.7	0.439	11.11
105_1	74.3	0.419	11.00
105_1	74.3	0.401	10.51
106	75.1	0.416	11.49
106	75.1	0.407	11.24
106	75.1	0.407	11.24
113	75.7	0.360	10.36
113	75.7	0.363	10.45
117_1	75.9	0.372	10.84
117_2	75.9	0.385	11.22
128	74.5	0.380	10.12
135_1	74.5	0.381	10.12
135_2	74.5	0.384	10.21
146	75.4	0.405	11.35
147	75.4	0.401	11.30
148	75.4	0.403	11.36
151	74.9	0.415	11.31
Means,	75.0	0.396	10.86
ω 120_1	77.3	0.335	10.82
120_2	79.3	0.259	9.91
132	79.4	0.262	10.12
134	79.5	0.262	10.22
135_1	79.5	0.262	10.22
135_2	79.5	0.260	10.12
136	79.5	0.266	10.36
Means,	79.1	0.272	10.25

TABLE 14.—MEAN RESULTS FOR EACH LINE FROM ALL PLATES. OBSERVATIONS OF 1908.

λ	Element	$\phi = 0°4$			$\phi = 4°1$			$\phi = 11°2$			$\phi = 14°9$		
		No of Plates	$v + v_1$	ξ	No of Plates	$v + v_1$	ξ	No of Plates	$v + v_1$	ξ	No of Plates	$v + v_1$	ξ
			km	°		km	°		km	°		km	°
4196 699	*La*	21	2 034	14 44	15	2 023	14 40	12	1 979	14 31	18	1 925	14 14
4197 257	*CN*	21	2 047	14 53	15	2 028	14 43	12	1 978	14 31	18	1 927	14 16
4203 730	*Cr*	21	2 061	14 63	15	2 034	14 48	12	1 992	14 42	18	1 944	14 28
4207 566	*CN*	21	2 054	14 58	15	2 038	14 50	12	1 989	14 39	18	1 937	14 23
4216 136	*CN*	21	2 042	14 49	15	2 031	14 46	12	1 983	14 34	18	1 930	14 18
4220 509	*Fe*	21	2 059	14 62	15	2 052	14 61	12	1 998	14 45	18	1 945	14 29
4232 887	*Fe*	21	2 066	14 67	15	2 048	14 58	12	1 992	14 41	18	1 948	14 31
4233 328	*Mn*	21	2 055	14 59	15	2 052	14 61	12	1 995	14 43	18	1 945	14 29
4257 815	*Mn*	21	2 077	14 75	15	2 049	14 58	12	1 998	14 45	18	1 953	14 34
4258 477	*Fe*	21	2 068	14 68	15	2 046	14 56	12	1 998	14 45	18	1 952	14 34
4265 418	*Fe*	21	2 060	14 62	15	2 042	14 53	12	1 993	14 41	18	1 946	14 30
4266 081	*Mn*	21	2 073	14 72	15	2 051	14 60	12	1 997	14 44	18	1 946	14 30
4268 915	*Fe*	21	2 073	14 72	15	2 045	14 56	12	1 994	14 42	18	1 949	14 32
4276 836	*-Zr*	21	2 067	14 68	15	2 037	14 50	12	1 986	14 36	18	1 948	14 31
4283 169	*Ca*	21	2 066	14 67	15	2 039	14 51	12	1 991	14 40	18	1 948	14 31
4284 838	*Ni*	21	2 069	14 69	15	2 040	14 52	12	1 988	14 38	18	1 936	14 22
4287 566	*Ti*	21	2 066	14 67	15	2 036	14 49	12	1 988	14 38	18	1 944	14 28
4288 310	*Ti, Fe*	21	2 064	14 65	15	2 036	14 49	12	1 990	14 39	18	1 949	14 32
4289 525	*Ca*	21	2 069	14 69	15	2 040	14 52	12	1 992	14 41	18	1 950	14 33
4290 377	*Ti*	21	2 059	14 62	15	2 034	14 48	12	1 986	14 36	18	1 938	14 24
4290 542	*Fe*	21	2 068	14 68	15	2 040	14 52	12	1 994	14 42	18	1 953	14 35
4291 630	*Fe*	21	2 071	14 70	15	2 041	14 53	12	1 992	14 41	18	1 947	14 30

λ	Element	$\phi = 19°2$			$\phi = 29°8$			$\phi = 34°1$			$\phi = 44°8$		
4196 699	*La*	14	1 859	13 98	16	1 652	13 52	15	1 546	13 26	17	1 275	12 75
4197 257	*CN*	14	1 859	13 98	16	1 655	13 54	15	1 544	13 24	17	1 280	12 80
4203 730	*Cr*	14	1 871	14 06	16	1 671	13 67	15	1 561	13 38	17	1 288	12 88
4207 566	*CN*	14	1 875	14 10	16	1 667	13 64	15	1 560	13 37	17	1 283	12 83
4216 136	*CN*	14	1 862	14 00	16	1 647	13 47	15	1 548	13 27	17	1 272	12 72
4220 509	*Fe*	14	1 874	14 09	16	1 671	13 67	15	1 561	13 38	17	1 288	12 88
4232 887	*Fe*	14	1 875	14 10	16	1 669	13 65	15	1 559	13 37	17	1 282	12 82
4233 328	*Mn*	14	1 878	14 12	16	1 662	13 60	15	1 561	13 38	17	1 287	12 87
4257 815	*Mn*	14	1 876	14 10	16	1 676	13 71	15	1 567	13 43	17	1 300	13 00
4258 477	*Fe*	14	1 871	14 06	16	1 677	13 72	15	1 560	13 37	17	1 294	12 94
4265 418	*Fe*	14	1 861	13 99	16	1 666	13 63	15	1 555	13 33	17	1 284	12 84
4266 081	*Mn*	14	1 873	14 08	16	1 672	13 68	15	1 561	13 38	17	1 297	12 97
4268 915	*Fe*	14	1 869	14 05	16	1 673	13 69	15	1 559	13 37	17	1 292	12 92
4276 836	*-Zr*	14	1 864	14 02	16	1 673	13 69	15	1 554	13 32	17	1 284	12 84
4283 169	*Ca*	14	1 866	14 03	16	1 672	13 68	15	1 553	13 32	17	1 287	12 87
4284 838	*Ni*	14	1 860	13 98	16	1 657	13 56	15	1 557	13 31	17	1 282	12 82
4287 566	*Ti*	14	1 862	14 00	16	1 671	13 67	15	1 554	13 32	17	1 292	12 92
4288 310	*Ti, Fe*	14	1 865	14 02	16	1 675	13 70	15	1 560	13 37	17	1 291	12 91
4289 525	*Ca*	14	1 861	13 99	16	1 676	13 71	15	1 558	13 36	17	1 297	12 97
4290 377	*Ti*	14	1 858	13 97	16	1 666	13 63	15	1 557	13 36	17	1 278	12 78
4290 542	*Fe*	14	1 869	14 05	16	1 683	13 77	15	1 565	13 42	17	1 294	12 94
4291 630	*Fe*	14	1 871	14 06	16	1 680	13 74	15	1 562	13 39	17	1 294	12 94

λ	Element	$\phi = 49°6$			$\phi = 60°1$			$\phi = 65°0$			$\phi = 75°0$			$\phi = 79°1$		
		No of Plates	$v + v_1$	ξ	No of Plates	$v + v_1$	ξ	No of Plates	$v + v_1$	ξ	No of Plates	$v + v_1$	ξ	No of Plates	$v + v_1$	ξ
			km	°		km	°		km	°		km	°		km	°
4196 699	*La*	16	1 125	12 32	22	0 791	11 26	17	0 658	11 05	17	0 380	10 42	7	0 267	10 02
4197 257	*CN*	16	1 125	12 32	22	0 791	11 26	17	0 663	11 14	17	0 385	10 56	7	0 269	10 10
4203 730	*Cr*	16	1 138	12 46	22	0 805	11 46	17	0 670	11 26	17	0 392	10 75	7	0 269	10 10
4207 566	*CN*	16	1 138	12 46	22	0 804	11 45	17	0 666	11 19	17	0 388	10 65	7	0 270	10 14
4216 136	*CN*	16	1 130	12 38	22	0 796	11 34	17	0 659	11 07	17	0 386	10 59	7	0 261	9 80
4220 509	*Fe*	16	1 144	12 53	22	0 805	11 46	17	0 671	11 27	17	0 400	10 97	7	0 267	10 02
4232 887	*Fe*	16	1 138	12 46	22	0 801	11 41	17	0 671	11 27	17	0 397	10 89	7	0 266	9 99
4233 328	*Mn*	16	1 139	12 48	22	0 805	11 46	17	0 671	11 27	17	0 386	10 59	7	0 269	10 10
4257 815	*Mn*	15	1 142	12 51	22	0 816	11 62	16	0 675	11 34	17	0 406	11 14	7	0 281	10 55
4258 477	*Fe*	15	1 138	12 46	22	0 807	11 49	16	0 672	11 29	17	0 399	10 94	7	0 267	10 02
4265 418	*Fe*	16	1 134	12 42	22	0 807	11 49	17	0 672	11 29	17	0 397	10 89	7	0 277	10 40
4266 081	*Mn*	16	1 141	12 50	22	0 805	11 46	17	0 676	11 36	17	0 402	11 03	7	0 282	10 59
4268 915	*Fe*	16	1 139	12 48	22	0 811	11 55	17	0 482	11 46	17	0 404	11 08	7	0 277	10 40
4276 836	*-Zr*	16	1 136	12 44	22	0 812	11 56	17	0 674	11 32	17	0 402	11 03	7	0 276	10 36
4283 169	*Ca*	16	1 139	12 48	22	0 811	11 55	17	0 672	11 29	17	0 398	10 91	7	0 274	10 29
4284 838	*Ni*	16	1 137	12 45	22	0 807	11 49	17	0 673	11 31	17	0 406	11 14	7	0 270	10 14
4287 566	*Ti*	16	1 134	12 42	22	0 810	11 54	17	0 670	11 26	17	0 400	10 97	7	0 274	10 29
4288 310	*Ti, Fe*	16	1 140	12 49	22	0 810	11 54	17	0 674	11 32	17	0 399	10 94	7	0 281	10 55
4289 525	*Ca*	16	1 144	12 53	22	0 808	11 51	17	0 679	11 41	17	0 399	10 94	7	0 279	10 47
4290 377	*Ti*	16	1 132	12 40	22	0 800	11 39	17	0 669	11 24	17	0 392	10 75	7	0 270	10 14
4290 542	*Fe*	16	1 141	12 50	22	0 812	11 56	17	0 677	11 37	17	0 402	11 03	7	0 270	10 14
4291 630	*Fe*	16	1 144	12 53	22	0 813	11 58	17	0 676	11 36	17	0 400	10 97	7	0 278	10 44



Spectra used in the Study of the Hα Line   Enlargement about 3.3 times

9 SPECIAL OBSERVATIONS ON THE α LINE OF HYDROGEN

As will be seen when we reach the discussion of the results for the individual lines of the reversing layer on page 109 of this investigation, the observations of 1906–1907 and of 1908 agree in indicating that different lines give different velocities of rotation Since this result clearly is connected with the level at which the lines originate in the sun's atmosphere, an investigation of the lines of the elements which show great differences of level becomes of much interest The two elements which appear to rise to the greatest height above the solar photosphere, as indicated by observations of the chromospheric spectrum, are calcium and hydrogen Unfortunately, accurate measures of the H and K lines of calcium at the sun's limb are very difficult, on account of the great variation in their width and appearance and the presence of bright reversals Exclusive of these lines, the blue line of calcium at λ 4227, which represents a considerably lower level than H and K, remains Among the hydrogen lines, $H\delta$ and $H\beta$ are practically ruled out on account of the presence of foreign lines, and $H\gamma$ is rendered unsymmetrical by the same cause. Accordingly, in the selection of lines for measurement only $H\alpha$ was left The investigation of this line became of interest for several other reasons. Photographs of the spectra of the center and limb of the sun indicated that $H\alpha$ was greatly widened at the limb, while the other hydrogen lines, with the possible exception of $H\beta$, were either unchanged or slightly narrowed The line also showed no such displacement toward the red at the sun's limb as was found for essentially all of the lines in the solar spectrum. Moreover, plates taken with the spectroheliograph with the α line showed structure differing in many respects from that obtained through the other hydrogen lines All of these results are in harmony with the chromospheric observations in indicating a very high level for the hydrogen gas which produces $H\alpha$ in the sun's atmosphere

The measurement of the center and limb plates soon showed that the $H\alpha$ line would give abnormally high rotational velocities, and the first photographs taken with the regular rotation apparatus confirmed this result A few preliminary results of this investigation were published early in 1908 (15), but a much more extensive series of plates was obtained during the spring of that year. The use of fine-grained plates sensitized to the red by the use of Wallace's formula proved of the greatest value in the investigation, since the edges of the line are so hazy as to make the superior defining power of these plates, and their excellent contrast, of much assistance in the measurement. All of the results given were obtained from plates of this character.

It is of course hardly necessary to state that the degree of accuracy attained in the measurement of $H\alpha$ is of quite another order from that for the narrow lines of the reversing layer The width of $H\alpha$ at the sun's limb is about 1 15 Ångstroms, as against 0 15 Ångström for the lines employed in the reversing layer. Moreover, all of the plates used for measurement were taken in the spectrum of the second order, thus giving a linear scale only two-thirds that used for the reversing layer It seems probable that the accidental errors of setting must be several times as great for $H\alpha$ as for the sharper and narrower lines.

I have already referred to the marked widening and change in appearance of $H\alpha$ at the sun's limb. The study of plates taken inside the limb soon showed that the greater part of this effect must take place within a comparatively narrow range, some 3 or 4 mm, on a solar radius of about 84 mm. This is what we should expect in case the change in the appearance of $H\alpha$ is due to the great increase in the length in path of the light at the sun's edge, since the length of this path decreases very rapidly with increasing distance inward from the limb Accordingly, two series of observations have been made, the first as close to the limb as the slit could be set without danger from the introduction of chromospheric light, and the second at an average distance of about 3 mm inside the limb The details of these observations and the summaries of the results are given in Tables 15–18 The tables are similar in arrangement to those containing the data for the reversing layer A comparison with the values for the normal places derived from the two series of observations on the reversing layer is given in Table 35.

TABLE 15 — OBSERVATIONS ON THE α LINE OF HYDROGEN AT THE LIMB

Plate No	Gr Mean Date	ϕ	Δ	v	$v+v_1$	ξ	Plate No	Gr Mean Date	ϕ	Δ	v	$v+v_1$	ξ
	1908 h m	°		km	km	°		1908 h m	°		km	km	°
ω 110	Mar 24 6 20	0 2	0 188	1 98	2 12	15 0	ω 126$_2$	June 9 10 15	−0 5	0 196	2 03	2 16	15 3
		15 1	0 180	1 91	2 05	15 1			14 5	0 182	1 88	2 01	14 7
		29 9	0 154	1 63	1 75	14 3			29 5	0 166	1 70	1 82	14 8
		44 3	0 127	1 34	1 45	14 4			44 5	0 128	1 32	1 43	14 2
		60 4	0 083	0 89	0 96	13 8			59 5	0 087	0 89	0 97	13 6
		65 3	0 069	0 76	0 82	13 9			75 0	0 046	0 48	0 53	14 5
		75 2	0 042	0 50	0 54	15 0							
ω 115	May 15 5 10	−0 4	0 192	2 01	2 15	15 3	ω 127$_1$	June 9 10 15	−0 5	0 195	2 02	2 15	15 3
		14 6	0 184	1 89	2 02	14 8			14 5	0 184	1 90	2 03	14 9
		29 6	0 153	1 59	1 71	14 0			29 5	0 161	1 67	1 79	14 6
		44 9	0 122	1 28	1 39	13 9			44 5	0 122	1 27	1 38	13 7
		60 5	0 082	0 86	0 94	13 6			59 5	0 083	0 86	0 94	13 1
		75 9	0 042	0 44	0 48	14 0			75 0	0 045	0 47	0 52	14 3
ω 118$_1$	June 1 10 30	−0 6	0 194	2 02	2 15	15 3	ω 127$_2$	June 9 10 15	−0 5	0 197	2 04	2 17	15 4
		14 4	0 184	1 92	2 05	15 0			14 5	0 182	1 89	2 02	14 8
		29 4	0 158	1 64	1 76	14 3			29 5	0 164	1 71	1 83	14 9
		44 9	0 135	1 41	1 51	15 1			44 5	0 125	1 30	1 41	14 0
		60 4	0 084	0 88	0 95	13 6			59 5	0 087	0 90	0 98	13 7
		75 9	0 042	0 45	0 49	14 3			75 0	0 044	0 46	0 51	14 0
ω 118$_2$	June 1 10 30	−0 6	0 196	2 04	2 17	15 4	ω 129	June 10 2 40	−0 5	0 195	2 01	2 14	15 2
		14 4	0 184	1 92	2 05	15 0			14 5	0 185	1 90	2 03	14 9
		29 4	0 155	1 61	1 73	14 1			29 5	0 166	1 70	1 82	14 8
		44 9	0 128	1 33	1 43	14 3			44 5	0 126	1 30	1 41	14 0
		60 4	0 086	0 89	0 96	13 8			59 5	0 085	0 88	0 96	13 4
		75 9	0 046	0 48	0 52	15 2			74 5	0 045	0 46	0 51	13 5
ω 122	June 9 2 45	−0 5	0 192	2 00	2 13	15 1	ω 130$_1$	June 10 2 40	−0 5	0 196	2 02	2 15	15 3
		14 5	0 178	1 86	1 99	14 6			14 5	0 184	1 90	2 03	14 9
		29 5	0 160	1 67	1 79	14 6			29 5	0 162	1 68	1 80	14 7
		44 5	0 120	1 24	1 35	13 4			44 5	0 125	1 29	1 40	13 9
		59 5	0 082	0 85	0 93	13 0			59 5	0 088	0 92	1 00	14 0
		75 0	0 042	0 44	0 49	13 4			74 5	0 046	0 47	0 52	13 8
ω 123	June 9 2 45	−0 5	0 196	2 03	2 16	15 3	ω 130$_2$	June 10 2 40	−0 5	0 196	2 02	2 15	15 3
		14 5	0 182	1 89	2 02	14 8			14 5	0 184	1 90	2 03	14 9
		29 5	0 159	1 65	1 77	14 4			29 5	0 161	1 66	1 78	14 5
		44 5	0 126	1 31	1 42	14 1			44 5	0 125	1 29	1 40	13 9
		59 5	0 084	0 88	0 96	13 4			59 5	0 083	0 86	0 94	13 1
		75 0	0 041	0 43	0 48	13 2			74 5	0 048	0 49	0 54	14 3
ω 124$_1$	June 9 2 45	−0 5	0 192	1 96	2 09	14 8	ω 131$_1$	June 10 2 40	−0 5	0 194	2 00	2 13	15 1
		14 5	0 185	1 90	2 03	14 9			14 5	0 185	1 89	2 02	14 8
		29 5	0 161	1 65	1 77	14 4			29 5	0 163	1 67	1 79	14 6
		44 5	0 126	1 29	1 31	13 0			44 5	0 125	1 30	1 41	14 0
		59 5	0 087	0 91	0 99	13 8			59 5	0 087	0 89	0 97	13 6
		75 0	0 046	0 47	0 52	14 3			74 5	0 045	0 46	0 51	13 5
ω 124$_2$	June 9 2 45	−0 5	0 196	2 01	2 14	15 2	ω 131$_2$	June 10 2 40	−0 5	0 193	1 99	2 12	15 1
		14 5	0 187	1 91	2 04	15 0			14 5	0 178	1 85	1 98	14 5
		29 5	0 160	1 65	1 77	14 4			29 5	0 158	1 62	1 74	14 2
		44 5	0 125	1 28	1 39	13 8			44 5	0 120	1 25	1 36	13 5
		59 5	0 086	0 89	0 97	13 6			59 5	0 080	0 82	0 90	12 6
		75 0	0 046	0 47	0 52	14 3			74 5	0 044	0 45	0 50	13 3
ω 125$_1$	June 9 7 10	−0 5	0 196	2 02	2 15	15 3	ω 141	Aug 5 4 30	−0 3	0 193	2 01	2 14	15 2
		14 5	0 184	1 90	2 03	14 9			14 6	0 183	1 91	2 04	15 0
		29 5	0 163	1 69	1 81	14 8			29 5	0 160	1 67	1 79	14 6
		44 5	0 126	1 30	1 41	14 0			44 7	0 124	1 31	1 41	14 1
		59 5	0 084	0 86	0 92	12 9			59 9	0 086	0 91	0 98	13 9
		75 0	0 044	0 45	0 50	13 7			74 9	0 046	0 52	0 56	15 3
ω 125$_2$	June 9 7 10	−0 5	0 194	2 01	2 14	15 2	ω 144	Aug 5 4 30	−0 3	0 192	2 01	2 14	15 2
		14 5	0 183	1 89	2 02	14 8			14 6	0 183	1 91	2 04	15 0
		29 5	0 162	1 67	1 79	14 6			29 5	0 160	1 67	1 79	14 6
		44 5	0 128	1 33	1 44	14 3			44 7	0 127	1 34	1 44	14 4
		59 5	0 084	0 87	0 96	13 4			59 9	0 088	0 93	1 00	14 3
		75 0	0 042	0 43	0 48	13 2			74 9	0 047	0 53	0 57	15 5
ω 126$_1$	June 9 10 15	−0 5	0 195	2 01	2 14	15 2	ω 171	Aug 27 11 30	0 3	0 191	1 98	2 12	15 1
		14 5	0 184	1 90	2 03	14 9			15 2	0 183	1 90	2 03	14 9
		29 5	0 163	1 68	1 80	14 7			30 0	0 157	1 63	1 75	14 3
		44 5	0 126	1 30	1 41	14 0			45 0	0 126	1 32	1 42	14 2
		59 5	0 084	0 86	0 94	13 1			60 2	0 084	0 91	0 98	14 0
		75 0	0 044	0 45	0 50	13 7			75 0	0 048	0 57	0 60	16 4

TABLE 16 — OBSERVATIONS ON THE α LINE OF HYDROGEN AT THE LIMB RESULTS FOR EACH LATITUDE

ϕ	$v+v_1$	ξ	ϕ	$v+v_1$	ξ	ϕ	$v+v_1$	ξ
°	km	°	°	km	°	°	km	°
0 2	2 12	15 0	15 1	2 05	15 1	29 9	1 75	14 3
0 4	2 12	15 3	14 6	2 02	14 8	29 6	1 71	14 0
0 6	2 15	15 3	14 4	2 05	15 0	29 4	1 76	14 3
0 6	2 17	15 4	14 4	2 05	15 0	29 4	1 73	14 1
0 5	2 16	15 3	14 5	2 02	14 8	29 5	1 77	14 4
0 5	2 13	15 1	14 5	1 99	14 6	29 5	1 79	14 6
0 5	2 09	14 8	14 5	2 03	14 9	29 5	1 77	14 4
0 5	2 14	15 2	14 5	2 04	15 0	29 5	1 77	14 4
0 5	2 15	15 3	14 5	2 03	14 9	29 5	1 81	14 8
0 5	2 14	15 2	14 5	2 02	14 8	29 5	1 79	14 6
0 5	2 14	15 2	14 5	2 03	14 9	29 5	1 80	14 7
0 5	2 16	15 3	14 5	2 01	14 7	29 5	1 82	14 8
0 5	2 15	15 3	14 5	2 03	14 9	29 5	1 79	14 6
0 5	2 17	15 4	14 5	2 02	14 8	29 5	1 83	14 9
0 5	2 14	15 2	14 5	2 03	14 9	29 5	1 82	14 8
0 5	2 15	15 3	14 5	2 03	14 9	29 5	1 80	14 7
0 5	2 15	15 3	14 5	2 03	14 9	29 5	1 78	14 5
0 5	2 13	15 1	14 5	2 02	14 8	29 5	1 79	14 6
0 5	2 12	15 1	14 5	1 98	14 5	29 5	1 74	14 2
0 3	2 14	15 2	14 6	2 04	15 0	29 5	1 79	14 6
0 3	2 14	15 2	14 6	2 04	15 0	29 5	1 76	14 6
0 3	2 12	15 1	15 2	2 03	14 9	30 0	1 75	14 3
Means, 0 46	2 145	15 21	14 56	2 027	14 89	29 54	1 783	14 51

ϕ	$v+v_1$	ξ	ϕ	$v+v_1$	ξ	ϕ	$v+v_1$	ξ
°	km	°	°	km	°	°	km	°
44 3	1 45	14 4	60 4	0 96	13 8	75 2	0 54	15 0
44 9	1 39	13 9	65 3	0 82	13 9	75 9	0 48	14 0
44 9	1 51	15 1	60 5	0 94	13 6	75 9	0 49	14 3
44 9	1 43	14 3	60 4	0 95	13 6	75 9	0 52	15 2
44 5	1 42	14 1	60 4	0 96	13 8	75 0	0 48	13 2
44 5	1 35	13 4	59 5	0 96	13 4	75 0	0 49	13.4
44 5	1 31	13 0	59 5	0 93	13 0	75 0	0 52	14 3
44 5	1 39	13 8	59 5	0 99	13 8	75 0	0 52	14 3
44 5	1 41	14 0	59 5	0 97	13 6	75 0	0 50	13.7
44 5	1 44	14 3	59 5	0 92	12 9	75 0	0 48	13 2
44 5	1 41	14 0	59 5	0 96	13 4	75 0	0 50	13 7
44 5	1 43	14 1	59 5	0 94	13 1	75 0	0 53	14 5
44 5	1 38	13 7	59 5	0 97	13 6	75 0	0 52	14 3
44 5	1 41	14.0	59 5	0 94	13 1	75 0	0 51	14 0
44 5	1 41	14 0	59 5	0 98	13 7	74 5	0 51	13 5
44 5	1 40	13 9	59 5	0 96	13 4	74 5	0 52	13 8
44 5	1 40	13 9	59 5	1 00	14 0	74 5	0 54	14 3
44 5	1 41	14 0	59 5	0 94	13 1	74 5	0 51	13.5
44 5	1 36	13 5	59 5	0 97	13 6	74 5	0.50	[illegible]
44 7	1 41	14 1	59 5	0 90	12 6	74 9	0 56	13 3
44 7	1 44	14 4	59 9	0 98	13 9	74 9	0 57	15 5
45 0	1 42	14 2	59 9	1 00	14 3	75 0	0 60	16 4
			60 2	0 98	14 0			
Means, 44 59	1 408	14 00	59 89	0 953	13 53	75 00	0 517	14.20

TABLE 17 — OBSERVATIONS ON THE α LINE OF HYDROGEN WITHIN THE LIMB

PLATE No	GR MEAN DATE	ϕ	Δ	v	$v+v_1$	ξ	PLATE No	GR MEAN DATE	ϕ	Δ	v	$v+v_1$	ξ
		°		km	km	°			°		km	km	°
ω 116	1908 May 15 6 h 30 m	0 1	0 188	2 03	2 17	15 4	ω 138	1808 Aug 4 12 h 30 m	0 4	0 182	1 95	2 08	14 8
		14 9	0 176	1 90	2 03	14 9			14 3	0 174	1 87	2 00	14 7
		29 9	0 151	1 63	1 75	14 3			30 2	0 150	1 61	1 72	14 1
		45 1	0 120	1 30	1 41	14 2			45 4	0 116	1 26	1 36	13 8
		60 8	0 078	0 84	0 92	13 4			60 6	0 070	0 80	0 87	12 6
		76 2	0 038	0 42	0 47	14 0			75 7	0 038	0 41	0 45	12 9
ω 119₁	June 1 0 40	−0 6	0 184	1 99	2 12	15 1	ω 142	Aug 5 4 30	−0 3	0 187	2 00	2 13	15 1
		14 4	0 175	1 89	2 02	14 8			14 6	0 177	1 90	2 03	14 9
		29 4	0 148	1 60	1 72	14 0			29 5	0 151	1 63	1 75	14 3
		44 9	0 119	1 28	1 38	13 8			44 7	0 121	1 30	1 40	14 0
		60 4	0 076	0 82	0 89	12 8			59 9	0 080	0 87	0 94	13 3
		75 9	0 037	0 40	0 44	12 8			74 9	0 038	0 44	0 48	13 1
ω 119₂	June 1 0 40	−0 6	0 184	1 99	2 12	15 1	ω 143	Aug 5 4 30	−0 3	0 186	1 99	2 12	15 0
		14 4	0 172	1 86	1 99	14 6			14 6	0 174	1 86	1 99	14 6
		29 4	0 148	1 60	1 72	14 0			29 5	0 148	1 59	1 72	14 0
		44 9	0 119	1 28	1 38	13 8			44 7	0 118	1 23	1 33	13 3
		60 4	0 074	0 80	0 87	12 5			59 9	0 080	0 86	0 93	13 2
		75 9	0 036	0 39	0 43	12 5			74 9	0 040	0 47	0 51	13 9
ω 137	Aug 4 12 30	0 4	0 184	1 97	2 10	14 9	ω 172	Aug 27 11 30	0 3	0 179	1 93	2 06	14 6
		14 3	0 174	1 86	1 99	14 6			15 2	0 173	1 85	1 98	14 6
		30 2	0 145	1 61	1 72	14 1			30 0	0 146	1 59	1 71	14 0
		45 4	0 120	1 29	1 39	14 0			45 0	0 116	1 27	1 37	13 8
		60 6	0 073	0 80	0 87	12 6			60 2	0 077	0 86	0 93	13 3
		75 7	0 038	0 41	0 45	12 9			75 0	0 040	0 49	0 52	14 3

TABLE 18 — OBSERVATIONS ON THE α LINE OF HYDROGEN WITHIN THE LIMB RESULTS FOR EACH LATITUDE

ϕ	$v+v_1$	ξ	ϕ	$v+v_1$	ξ	ϕ	$v+v_1$	ξ
°	km	°	°	km	°	°	km	°
0 1	2 17	15 4	14 9	2 03	14 9	29 9	1 75	14 3
0 6	2 12	15 1	14 4	2 02	14 8	29 4	1 72	14 0
0 6	2 12	15 1	14 4	1 99	14 6	29 4	1 72	14 0
0 4	2 10	14 9	14 3	1 99	14 6	30 2	1 72	14 1
0 4	2 08	14 8	14 3	2 00	14 7	30 2	1 72	14 1
0 3	2 13	15 1	14 6	2 03	14 9	29 5	1 75	14 3
0 3	2 12	15 0	14 6	1 99	14 6	29 5	1 72	14 0
0 3	2 06	14 6	15 2	1 98	14 6	30 0	1 71	14 0
Means, 0 4	2 112	15 00	14 6	2 004	14 71	29 8	1 726	14 10

ϕ	$v+v_1$	ξ	ϕ	$v+v_1$	ξ	ϕ	$v+v_1$	ξ
°	km	°	°	km	°	°	km	°
45 1	1 41	14 2	60 8	0 92	13 4	76 2	0 47	14 0
44 9	1 38	13 8	60 4	0 89	12 8	75 9	0 44	12 8
44 9	1 38	13 8	60 4	0 87	12 5	75 9	0 43	12 5
45 4	1 39	14 0	60 6	0 87	12 6	75 7	0 45	12 9
45-4	1 36	13 8	60 6	0 87	12 6	75 7	0 45	12 9
44 9	1 40	14 0	59 9	0 94	13 3	74 9	0 48	13 1
44 7	1 33	13 3	59 9	0 93	13 2	74 9	0 51	13 9
45 0	1 37	13 8	60 2	0 93	13 3	75 0	0 52	14 3
Means, 45 0	1 378	13 84	60 4	0 902	12 96	75 5	0 469	13 30

10 SPECIAL OBSERVATIONS ON λ 4227 OF CALCIUM

The line λ 4227 of calcium appears upon all of the plates taken for the investigation of the rotation of the sun with the lines of the reversing layer The quality of these negatives, however, is not well adapted for the study of this line, which is very diffuse and has broad wings extending on either side Accordingly, I have taken a separate series of plates in which the density is made sufficiently great to reduce these wings considerably and thus define the central portion of the line to somewhat better advantage In spite of this fact its measurement is difficult, and it is doubtful whether the degree of accuracy attained is any higher than in the case of *Hα*

In Tables 19 and 20 are found the details of the observations and a summary of the results The values for the normal places are collected and compared with those for the reversing layer in Table 36

TABLE 19 —OBSERVATIONS ON λ 4227 OF CALCIUM

PLATE No	GR MEAN DATE	ϕ	Δ	v	$v+v_1$	ξ	PLATE No	GR MEAN DATE	ϕ	Δ	v	$v+v_1$	ξ
	1908 h m	°		km	km	°		1908 h m	°		km	km	°
ω 149	Aug 5 11 40	0 4	0 182	1 97	2 10	14 9	ω 167	Aug 27 7 0	0 6	0 184	2 01	2 15	15 3
		15 5	0 172	1 87	2 00	14 7			15 0	0 176	1 92	2 05	15 1
		30 2	0 150	1 63	1 75	14 4			29 8	0 152	1 67	1 79	14 6
		45 6	0 111	1 21	1 31	13 3			44 8	0 119	1 30	1 40	14 0
		60 8	0 070	0 77	0 84	12 2			60 0	0 074	0 85	0 92	13 1
		75 5	0 036	0 44	0 48	13 6			74 8	0 038	0 42	0 46	12 5
ω 150	Aug 5 11 40	0 4	0 180	1 95	2 08	14 8	ω 168	Aug 27 7 0	0 6	0 182	1 98	2 12	15 0
		15 3	0 172	1 86	1 99	14 6			15 0	0 176	1 91	2 04	15 0
		30 2	0 147	1 60	1 72	14 1			29 8	0 150	1 64	1 76	14 4
		45 6	0 111	1 21	1 31	13 3			44 8	0 119	1 30	1 40	14 0
		60 8	0 068	0 75	0 82	11 9			60 0	0 077	0 85	0 92	13 1
		75 5	0 035	0 42	0 46	13 0			74 8	0 044	0 54	0 58	15 7
ω 152	Aug 6 5 40	0 3	0 185	2 01	2 14	15 2	ω 169	Aug 27 7 0	0 6	0 184	2 01	2 15	15 3
		15 2	0 171	1 85	1 98	14 6			15 0	0 176	1 92	2 03	14 9
		30 1	0 148	1 62	1 74	14 3			29 8	0 152	1 62	1 74	14 2
		45 2	0 112	1 22	1 32	13 3			44 8	0 118	1 29	1 39	13 9
		60 4	0 072	0 79	0 86	12 4			60 0	0 074	0 82	0 89	12 6
		75 4	0 034	0 41	0 45	12 7			74 8	0 043	0 53	0 57	15 4
ω 153	Aug 6 5 40	0 3	0 183	1 99	2 12	15 1	ω 170	Aug 27 7 0	0 6	0 186	2 02	2 16	15 3
		15 2	0 171	1 86	1 99	14 6			15 0	0 176	1 92	2 05	15 1
		30 1	0 148	1 64	1 76	14 4			29 8	0 149	1 63	1 75	14 3
		45 2	0 112	1 22	1 32	13 3			44 8	0 120	1 32	1 42	14 2
		60 4	0 070	0 77	0 84	12 1			60 0	0 080	0 89	0 96	13 6
		75 4	0 033	0 39	0 43	12 1			74 8	0 042	0 51	0 55	14 9
ω 154	Aug 6 5 40	0 3	0 180	1 97	2 10	14 9	ω 188	Oct 22 10 30	−0 1	0 184	1 99	2 13	15 1
		15 2	0 174	1 89	2 02	14 9			14 8	0 172	1 86	2 [illegible]0	14 7
		30 1	0 148	1 64	1 76	14 4			29 8	0 153	1 66	1 79	14.6
		45 2	0 114	1 23	1 33	13 4			44 9	0 115	1 25	1 36	13 6
		60 4	0 067	0 74	0 81	11 6			60 2	0 075	0 79	0 87	12 4
		75 4	0 032	0 38	0 42	11 8			75 9	0 039	0 45	0.49	14 3
									−0 1	0 181	1 96	2 10	14 9
ω 157	Aug 13 5 10	−0 3	0 184	1 99	2 13	15 1	ω 189	Oct 22 10 30	14 8	0 175	1 88	2 02	14 8
		14 6	0 176	1 91	2 04	15 0			29 8	0 154	1 67	1 80	14 7
		29 5	0 147	1 59	1 71	13 9			44 9	0 118	1 28	1 39	13 9
		44 1	0 116	1 26	1 36	13 4			60 2	0 079	0 85	0 93	13 3
		58 4	0 073	0 81	0 89	12 0			75 9	0 037	0 44	0 48	14 0
		72 0	0 037	0 42	0 47	10 8							
ω 158	Aug 13 5 10	−0 3	0 182	1 97	2 11	15 0							
		14 6	0 176	1 91	2 04	15 0							
		29 5	0 146	1 58	1 70	13 9							
		44 1	0 114	1 23	1 33	13.1							
		58 4	0 074	0 81	0 89	12 0							
		72 0	0 041	0 48	0 53	12 2							

TABLE 20 — OBSERVATIONS ON λ 4227 OF CALCIUM RESULTS FOR EACH LATITUDE

ϕ	$v+v_1$	ξ	ϕ	$v+v_1$	ξ	ϕ	$v+v_1$	ξ
°	km	°	°	km	°	°	km	°
0 4	2 10	14 9	15 3	2 00	14 7	30 2	1 75	14 4
0 4	2 08	14 8	15 3	1 99	14 6	30 2	1 72	14 1
0 3	2 14	15 2	15 2	1 98	14 6	30 1	1 74	14 3
0 3	2 12	15 1	15 2	1 99	14 6	30 1	1 76	14 4
0 3	2 10	14 9	15 2	2 02	14 9	30 1	1 76	14 4
0 3	2 13	15 1	14 6	2 04	15 0	29 5	1 71	13 9
0 3	2 11	15 0	14 6	2 04	15 0	29 5	1 70	13 9
0 6	2 15	15 3	15 0	2 05	15 1	29 8	1 79	14 6
0 6	2 12	15 0	15 0	2 04	15 0	29 8	1 76	14 4
0 6	2 15	15 3	15 0	2 03	14 9	29 8	1 74	14 2
0 6	2 16	15 3	15 0	2 05	15 1	29 8	1 75	14 3
0 1	2 13	15 1	14 8	2 00	14 7	29 8	1 79	14 6
0 1	2 10	14 9	14 8	2 02	14 8	29 8	1 80	14 7
Means, 0 38	2 122	15 07	15 00	2 019	14 85	29 88	1 752	14 32

ϕ	$v+v_1$	ξ	ϕ	$v+v_1$	ξ	ϕ	$v+v_1$	ξ
°	km	°	°	km	°	°	km	°
45 6	1 31	13 3	60 8	0 84	12 2	75 5	0 48	13 6
45 6	1 31	13 3	60 8	0 82	11 9	75 5	0 46	13 0
45 2	1 32	13 3	60 4	0 86	12 4	75 4	0 45	12 7
45 2	1 32	13 3	60 4	0 84	12 1	75 4	0 43	12 1
45 2	1 33	13 4	60 4	0 81	11 6	75 4	0 42	11 8
44 1	1 36	13 4	58 4	0 89	12 0	72 0	0 47	10 8
44 1	1 33	13 1	58 4	0 89	12 0	72 0	0 53	12 2
44 8	1 40	14 0	60 0	0 92	13 1	74 8	0 46	12 5
44 8	1 40	14 0	60 0	0 92	13 1	74 8	0 58	15 7
44 8	1 39	13 9	60 0	0 89	12 6	74 8	0 57	15 4
44 8	1 42	14 2	60 0	0 96	13 6	74 8	0 55	14 9
44 9	1 36	13 6	60 2	0 87	12 4	75 9	0 49	14 3
44 9	1 39	13 9	60 2	0 93	13 3	75 9	0 48	14 0
Means, 44 92	1 357	13 52	60 00	0 880	12 48	74 78	0 490	13 31

DISCUSSION OF THE RESULTS.

11 Systematic Deviations of Velocity of Rotation derived from Various Lines of the Reversing Layer

One of the most important questions connected with the results of this investigation is whether the lines of different elements give values which differ from one another in any systematic way, indicating a longer or shorter period of rotation for the various elements in the sun's atmosphere The behavior of the individual lines in this regard will be shown best if we form the difference in the value of the angular velocity of ξ for each line from that of the mean of all the lines Any systematic effect will show itself at once by the marked preponderance of the positive or the negative sign in the residuals The results of such a comparison are given for the two series of observations in Tables 21 and 22. In forming these differences I have rounded off the results to one place of decimals, although the reduction tables have been carried to two places This has seemed desirable in order to facilitate rapid comparison of the results. In the formation of the mean deviations for several latitudes, however, the second place has been retained

An examination of these tables leads to several important conclusions The most striking of these are, on the one hand, the systematically low values given by the lanthanum line at λ 4196 699, the cyanogen lines λ 4197 257 and λ 4216 136, and the enhanced line of titanium at λ 4290 377, and, on the other hand, the high values given by λ 4257 815 and possibly one or two other lines in the list The evidence for concluding that lanthanum and cyanogen occupy a relatively low level in the sun's atmosphere has already been referred to in connection with the discussion of the selection of the lines chosen for measurement In the case of lanthanum reference should be made to an additional point of evidence, namely, that its lines, like those of other elements of very high atomic weight, are much weakened at the sun's limb The fact, accordingly, that the lines of cyanogen and lanthanum give consistently low values for the angular velocity of rotation indicates that the sun's period of rotation increases as we approach its surface, or that the outer layers of the solar atmosphere move more rapidly than those lying close to the photosphere This is in agreement with the results found for hydrogen and other substances which rise to a great height above the solar surface, and to which extended reference will be made later

Table 21 —Deviations of Angular Velocity for Individual Lines from Mean Value Observations of 1906–1907

λ	Element	0°.2	7°.7	15°.0	22°.7	29°.8	37°.8	44°.6	52°.7	59°.6	65°.6	75°.1	80°.4
		°	°	°	°	°	°	°	°	°	°	°	°
4196 699	*La*	0.0	0.0	−0.1	−0.1	−0.1	−0.2	−0.2	−0.3	−0.4	−0.3	−0.8	−0.3
4197 257	*CN*	0.0	0.0	0.0	−0.1	0.0	−0.2	−0.1	−0.3	−0.2	−0.3	−0,8	−0.4
4203 730	*Cr*	+0.2	+0.1	+0.1	0.0	+0.1	0.0	0.0	0.0	+0.1	0.0	+0.2	+0.2
4209 144	*Zr*	+0.2	+0.1	+0.1	+0.1	+0.2	+0.1	+0.2	0.0	+0.2	+0.1	+0.1	+0.1
4216 136	*CN*	−0.1	0.0	−0.1	−0.1	−0.2	−0.1	−0.2	−0.3	−0.2	−0.4	−0.8	−0.3
4220 509	*Fe*	+0.1	+0.1	+0.1	+0.1	+0.2	+0.1	+0.1	0.0	0.0	0.0	+0.2	+0.4
4232 887	*Fe*	+0.1	+0.1	+0.1	+0.1	+0.1	0.0	0.0	0.0	+0.1	+0.1	[illegible]	+0.1
4257 815	*Mn*	+0.1	+0.2	+0.1	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.3	+0,6	+0.3
4258 477	*Fe*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	+0.2	+0.1	+0.2	−0.4
4265 418	*Fe*	0.0	0.0	+0.1	0.0	0.0	0.0	0.0	0.0	+0.1	0.0	0.0	0.0
4266 081	*Mn*	0.0	+0.1	0.0	+0.1	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.5	+0.4
4268 915	*Fe*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	+0.2	+0.1	0.0
4276 826	*-Zr*	0.0	+0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	+0.1	0.0	0.0
4284 838	*Ni*	0.0	−0.1	0.0	0.0	−0.1	0.0	0.0	+0.1	0.0	0.0	0.0	[illegible]
4287 566	*Ti*	0.0	−0.1	0.0	0.0	−0.1	0.0	0.0	0.0	+0.1	+0.1	+0.1	[illegible]
4288 310	*Ti, Fe*	0.0	−0.1	−0.1	0.0	0.0	0.0	−0.1	+0.1	0.0	0.0	+0.1	0.0
4290 377	*Ti*	−0.2	−0.2	−0.1	−0.1	−0.1	−0.1	−0.1	+0.1	−0.1	0.0	−0.1	−0.4
4290 542	*Fe*	−0.1	−0.1	−0.1	0.0	−0.1	0.0	−0.1	0.0	−0.1	0.0	+0.1	−0.1
4291 630	*Fe*	−0.1	−0.1	−0.1	−0.1	−0.1	0.0	0.0	0.0	−0.1	+0.1	+0.4	0.0
4294 936	*Zr*	−0.1	−0.1	−0.1	−0.1	−0.1	0.0	0.0	+0.1	+0.1	0.0	0.0	0.0

TABLE 22 —DEVIATIONS OF ANGULAR VELOCITY FOR INDIVIDUAL LINES FROM MEAN VALUE OBSERVATIONS OF 1908

λ	ELEMENT	0°4	4°1	11°2	14°9	19°2	29°8	34°1	44°8	49°6	60°1	65°0	75°0	79°1
		°	°	°	°	°	°	°	°	°	°	°	°	°
4196 699	*La*	−0 2	−0 1	−0 1	−0 1	−0 1	−0 1	−0 1	−0 1	−0 1	−0 2	−0 2	−0 4	−0 2
4197 257	*CN*	−0 1	−0 1	−0 1	−0 1	−0 1	−0 1	−0 1	−0 1	−0 1	−0 2	−0 2	−0 3	−0 1
4203 730	*Cr*	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	−0 1	−0 1
4207 566	*CN*	0 0	0 0	0 0	0 0	+0 1	0 0	0 0	0 0	0 0	0 0	−0 1	−0 5	−0 1
4216 136	*CN*	−0 1	−0 1	−0 1	−0 1	0 0	−0 2	−0 1	−0 2	−0 1	−0 1	−0 2	−0 3	−0 4
4220 509	*Fe*	0 0	0 0	0 0	0 0	0 0	0 0	+0 1	0 0	+0 1	0 0	0 0	+0 1	−0 2
4232 887	*Fe*	0 0	0 0	0 0	0 0	+0 1	0 0	0 0	−0 1	0 0	−0 1	0 0	0 0	−0 3
4233 328	*Mn*	0 0	+0 1	0 0	0 0	+0 1	0 0	0 0	0 0	0 0	0 0	0 0	−0 3	−0 2
4257 815	*Mn*	+0 1	0 0	0 0	+0 1	+0 1	+0 1	+0 1	+0 1	+0 1	+0 1	+0 1	+0 3	+0 3
4258 477	*Fe*	0 0	0 0	0 0	+0 1	0 0	+0 1	0 0	+0 1	0 0	0 0	0 0	+0 1	+0 2
4265 418	*Fe*	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	+0 2
4266 081	*Mn*	+0 1	+0 1	0 0	0 0	0 0	+0 1	0 0	+0 1	0 0	0 0	+0 1	+0 2	+0 3
4268 915	*Fe*	+0 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	+0 1	+0 2	+0 2	+0 2
4276 836	*-Zr*	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	+0 1	0 0	+0 2	+0 1
4283 169	*Ca*	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	+0 1	0 0	0 0	0 0
4283 838	*Ni*	0 0	0 0	0 0	−0 1	−0 1	−0 1	0 0	−0 1	0 0	0 0	0 0	+0 2	−0 1
4287 566	*Ti*	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	−0 1	0 0	+0 1	0 0
4288 310	*Ti, Fe*	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	+0 1	0 0	+0 1	+0 3
4289 525	*Ca*	0 0	0 0	0 0	0 0	0 0	+0 1	0 0	+0 1	+0 1	0 0	+0 1	+0 1	+0 2
4290 377	*Ti*	0 0	0 0	0 0	0 0	−0 1	0 0	0 0	−0 1	0 0	−0 1	0 0	−0 1	−0 1
4290 542	*Fe*	0 0	0 0	0 0	+0 1	0 0	+0 1	+0 1	+0 1	0 0	+0 1	+0 1	+0 2	−0 1
4291 630	*Fe*	+0 1	0 0	0 0	0 0	0 0	+0 1	0 0	+0 1	+0 1	+0 1	+0 1	+0 1	+0 2

The agreement of the two series of observations as regards the amount of this effect in the lower latitudes is excellent The 1906–1907 observations give −0 10 for the lanthanum line between 0° and 45° of latitude, and the 1908 observations give −0°11 Similarly for the mean of the cyanogen lines the earlier observations give −0°09 and the later observations −0°11 A difference of −0°10 in the value of the angular velocity at the equator would correspond to a difference in the rotation period of about 0 17 day

The enhanced line of titanium at λ 4290 377 is of especial interest It is well known from observations of the spectrum of the chromosphere that the enhanced lines, as a class, are relatively much more prominent in the chromosphere than they are in the ordinary solar spectrum This would apparently indicate a higher average level in the sun's atmosphere On the other hand, the line is considerably shifted at the limb of the sun,* and this points to a relatively low level The systematically low value of the angular velocity of rotation furnishes additional evidence in the same direction Further evidence is afforded on this subject by the only other enhanced line in either list, that due to iron, λ 4233 328 The mean value of ξ in its case agrees closely with the mean derived from all the lines Since it is a very prominent chromospheric line, however, the fact that it does not give a large value for the angular rate of rotation is strong evidence that it does not originate at any very considerable height in the sun's atmosphere The explanation of this apparent discrepancy of results is not at present clear It seems fairly probable that the difficulty will be found to be due to the interpretation of the chromospheric results, and that the relative strength of the enhanced lines does not necessarily indicate a higher level in the solar atmosphere One hypothesis founded on this basis was published by Evershed in 1900 (18) Another possible explanation is indicated by some preliminary results obtained by Mr Gale and myself while working on the displacements in the spectrum of a spark under pressure, but considerable additional material will be necessary to give it adequate weight

Of the lines which give positive residuals, that due to manganese at λ 4257 815 is the most prominent in both series of observations This line is not a chromospheric line, at least of any considerable intensity, nor is it much affected at the sun's limb In sun-spots it is slightly strengthened There is some evidence in both sets of observations, especially in the earlier, that λ 4266 081 gives similar results It is included

* In referring to shifts at the sun's limb, the differential shift compared with the center of the sun as freed from rotational displacements is always understood For convenience we may designate it as "pressure" shift, although pressure alone is probably not sufficient to account for all the effects observed

as a chromospheric line in some lists, but is of comparatively slight intensity The three lines in the list which are most strengthened at the sun's limb, λ 4232 887, λ 4258 477, and λ 4291 630, all give values close to the mean, with a very slight tendency toward positive residuals Reference should also be made to the line at λ 4207 566 This is assigned in Rowland's table to iron, but in the list of corrections is transferred to carbon Its appearance is strongly indicative of a compound origin, as it is much wider than other lines of the same intensity in its vicinity At the limb of the sun it shows a considerable displacement — so much larger, in fact, than other neighboring cyanogen lines as to make its composite character almost certain Accordingly, the evidence afforded by this line can not be considered as contradictory to that of the other cyanogen lines in the list

12 Increase of Deviations in Higher Latitudes

Another possible conclusion of great importance is afforded by an inspection of these tables, but it should be accepted with considerable caution This is the apparent increase in the amount of the deviations for such lines as show systematically large or small values of the angular velocity toward the sun's pole Thus the average deviation from the mean for the two cyanogen lines λ 4197 257 and λ 4216 136 between latitudes 60° and 80° is $-0^{\circ}3$ as against $-0^{\circ}1$ between latitudes 0° and 20° Similarly the lanthanum line λ 4196 699 gives $-0^{\circ}3$ against $-0^{\circ}1$, while the manganese line λ 4257 815 gives $+0^{\circ}3$ against $+0^{\circ}1$ The 1908 observations give considerably smaller values for these differences than do the earlier results, but the effect is still well marked, the values in the higher latitudes amounting to more than twice those near the equator It is of course true that a very small difference in linear velocity in the higher latitudes corresponds to a large difference in angular velocity, and so a wider range is to be expected among the values for the individual lines For example, at the equator a change in the linear velocity of 0 01 km corresponds to $0^{\circ}07$ in the angular velocity, while at 80° of latitude it corresponds to $0^{\circ}41$ If due to this cause, however, we should expect the values of the differences in the higher latitudes to be both larger and smaller than those near the equator and not to exhibit this systematic increase In spite of this effect, the evidence might be considered rather doubtful if it were not for the strong support afforded by the behavior of two lines of elements which rise to a great height in the sun's atmosphere These are the *a* line of hydrogen and λ 4227 of calcium. The results for these lines will be considered in detail at a later point in this discussion, though the evidence furnished by them regarding changes of rotation rate in the higher latitudes properly belongs here In the brief accompanying table are given the differences for such lines as show systematically large or small values of the angular velocity from a mean obtained from all the lines in the reversing-layer list

λ	Element	Latitude 0° – 20°	Latitude 60° – 80°
		°	°
4196 699	*La*	− 0 1	− 0 3
4197 257 } 4216 136 }	*CN*	− 0 1	− 0 3
4257 815	*Mn*	+ 0 1	+ 0 3
4226 904	*Ca*	+ 0 4	+ 1 6
6563 045	*H*	+ 0 6	+ 2 8

The great increase in the value of ξ in the case of the last two lines is most striking, and in spite of the relatively low degree of accuracy attained in the measurement of these lines as compared with those of the reversing layer, such differences as these must certainly be considered as real Accordingly, we may say that there is a strong presumption for concluding that, in the case of lines showing relatively large or small velocities at the equator, the values of deviations from the mean increase in the higher latitudes It is of interest to note that the variations in angular velocity which Halm believed he had discovered during the different years included in his observations were greatest toward the pole.

13 Mean Results for the Reversing Layer — Variability of the Solar Rotation — Comparison of Results with those of Other Observers

We may now pass on to an investigation of the general results While it appears clear from the preceding considerations that certain lines in the list give values which are systematically high or low, the number of lines of the two kinds seems to be so nearly equal that no appreciable error from this source will affect the mean taken from all the lines If we form means of the results of the two series of observations for the normal points of latitude indicated in Tables 6 and 13, we obtain the values given in Table 23 The weights are according to the number of observations The results are shown graphically in Fig 1, the dotted curve corresponding to the 1906–1907 observations and the full-line curve to the 1908 observations In each case the agreement of the points with the curve is excellent, the largest deviation falling at the points of lowest weight

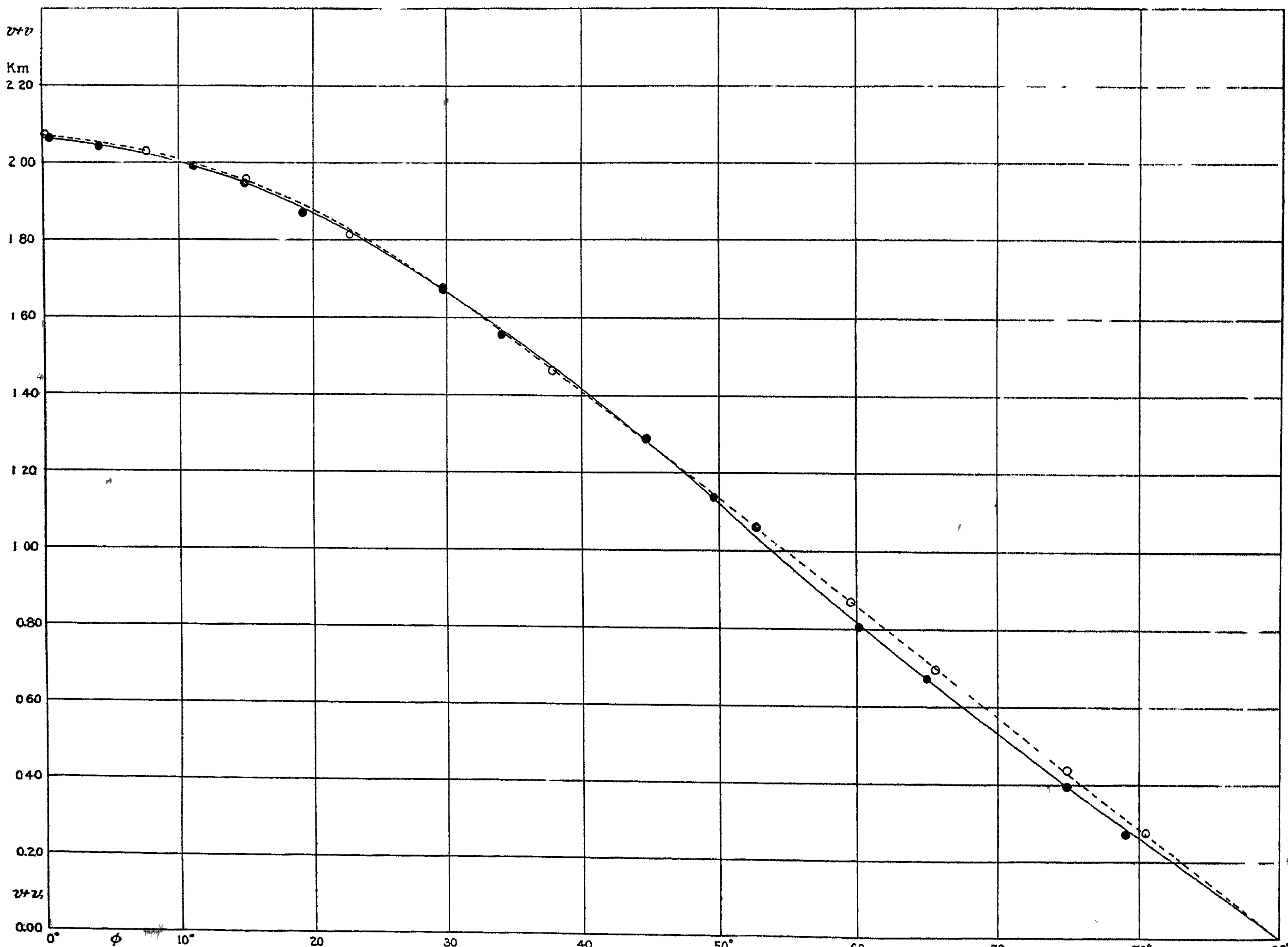


Fig 1 — Curves representing the variation of radial velocity with heliographic latitude for the two series of observations 1906–1907 and 1908 The broken-line curve represents the 1906–1907 observations, the full-line curve those of 1908

TABLE 23.—MEAN RESULTS FOR THE REVERSING LAYER

Observations of 1906–1907					Observations of 1908				
ϕ	Weight	$v+v_1$	ξ	Period	ϕ	Weight	$v+v_1$	ξ	Period
°		km	°	days	°		km	°	days
0.2	21	2.074	14.73	24.44	0.4	21	2.062	14.64	24.59
7.7	15	2.028	14.53	24.77	4.1	15	2.040	14.53	24.78
15.0	24	1.957	14.40	25.00	11.2	12	1.991	14.40	25.00
22.7	13	1.811	13.94	25.82	14.9	18	1.944	14.28	25.21
29.8	24	1.676	13.71	26.26	19.2	14	1.807	14.04	25.64
37.8	16	1.461	13.13	27.42	29.8	16	1.669	13.65	26.37
44.6	23	1.283	12.80	28.12	34.1	15	1.557	13.35	26.96
52.7	18	1.060	12.43	28.96	44.8	17	1.287	12.87	27.97
59.6	24	0.867	12.15	29.63	49.6	16	1.137	12.45	28.92
65.6	20	0.694	11.96	30.10	60.1	22	0.806	11.49	31.33
75.1	33	0.435	11.98	30.05	65.0	17	0.671	11.30	31.86
80.4	11	0.277	11.80	30.51	75.0	17	0.396	10.86	33.15
					79.1	7	0.272	10.25	35.12

The most interesting question involved in these results is whether an actual variation in the sun's rate of rotation is indicated. To facilitate direct comparison the values from the two series of observations for every 5° of latitude are given in Table 24. They are obtained from empirical formulæ which satisfy the observations closely. The derivation of these formulæ will be indicated later in the discussion.

TABLE 24.—COMPARISON OF THE RESULTS FOR THE TWO SERIES

ϕ	$v+v_1$			ξ		
	1906–1907	1908	Difference	1906–1907	1908	Difference
°	km	km	km	°	°	°
0	2.064	2.053	+0.011	14.63	14.61	+0.02
5	2.052	2.041	+0.011	14.60	14.58	+0.02
10	2.015	2.006	+0.009	14.51	14.49	+0.02
15	1.956	1.947	+0.009	14.37	14.34	+0.03
20	1.877	1.869	+0.008	14.18	14.14	+0.04
25	1.779	1.772	+0.007	13.94	13.89	+0.05
30	1.666	1.660	+0.006	13.68	13.60	+0.08
35	1.542	1.534	+0.008	13.39	13.28	+0.11
40	1.409	1.399	+0.010	13.10	12.94	+0.16
45	1.272	1.258	+0.014	12.81	12.59	+0.22
50	1.132	1.114	+0.018	12.54	12.24	+0.30
55	0.992	0.968	+0.024	12.30	11.90	+0.40
60	0.852	0.822	+0.030	12.11	11.58	+0.53
65	0.713	0.678	+0.035	11.97	11.29	+0.68
70	0.576	0.537	+0.039	11.90	11.04	+0.86
75	0.437	0.400	+0.037	11.91	10.84	+1.07

An inspection of these results shows that the 1908 observations give slightly smaller values than the earlier series between latitudes 0° and 40°, and decidedly smaller values between 45° and 80°. In the lower latitudes the largest difference is at the equator and amounts to 0.011 km for $v+v_1$. Although this is perhaps larger than might be expected from the internal agreement of the measures, it is hardly sufficient to warrant the conclusion that a source of systematic error is present, or that any variation in the sun's rate of rotation is indicated.

In the higher latitudes the case is somewhat different, however. At latitude 70° a maximum difference of 0.039 km is reached, a quantity which is decidedly larger than would be expected from errors of measure-

ment alone, even though it has been found that such errors are usually greater in high latitudes. At present it does not seem possible to decide whether this lack of agreement is due to a real variation in the sun's rate of rotation, to the presence of some source of systematic error in the observations, or to the disturbing effect of proper motions in the sun's reversing layer. I am inclined, however, to ascribe it mainly to small systematic errors in the earlier series of observations. The principal sources of error to which these were subject have already been referred to, and there is little doubt that they must have affected the results to some extent. As several of these difficulties were eliminated, or their effect much reduced, in the later series of observations, and as the check by means of the exposure on the sun's pole was available in the later results, it is highly probable that the greater part of the difficulty is to be looked for in the earlier series. If such is the case, the single most serious cause of error is probably the astigmatism of the sun's image.

The influence of proper motion in the reversing layer may be very appreciable in its effect upon the values of the solar rotation, and it is possible that this cause may be in part accountable for the discrepancies between the two series of results. As will be shown in another place, proper motions amounting to as much as 0.2 km have been found in a disturbed region in the neighborhood of spots, and of course it is highly probable that motions of smaller amount are present frequently. The probability of their occurrence in high latitudes, however, would appear to be less than in the zones of chief spot activity.

There seem to be three main arguments against the conclusion that these results indicate an actual variation in the sun's period of rotation. The first of these is that the variation, if present, seems to be confined to the higher latitudes. It would certainly appear probable that such an effect would be marked in the zones of greatest spot activity, between 10° and 30° of latitude, and differences in these zones were found by Halm (9) in the series of observations from which he concluded the existence of such a variation. On the other hand, the values given here indicate essentially no difference for the years 1906–1907 and 1908 between 0° and 40° of latitude. We have seen, however, that all of the spectrum lines which show abnormal values of the rotational velocity, such as those of cyanogen, lanthanum, calcium, and hydrogen, appear to give the largest deviations from the normal values in the higher latitudes. Accordingly, the existence of a variation in the sun's rate of rotation which is confined to high latitudes is perhaps less anomalous than might at first appear.

A second argument against the occurrence of a variation in the sun's rotation period is the close agreement of the results given here for 1908 with Dunér's values obtained from observations extending through six years, from 1887 to 1889 and from 1899 to 1901. A comparison of the 1906–1907 and 1908 observations with those of Dunér for the six latitudes employed by him gives the results in Table 25, the values being obtained in all cases from the corresponding empirical formulæ.

TABLE 25.—COMPARISON OF THE RESULTS WITH THOSE OF DUNÉR

ϕ	1906–1907		1908		Dunér	
	$v+v_1$	ξ	$v+v_1$	ξ	$v+v_1$	ξ
°	km	°	km	°	km	°
0	2.06	14.62	2.05	14.54	2.08	14.81
15	1.96	14.38	1.95	14.32	1.97	14.53
30	1.67	13.66	1.66	13.61	1.67	13.76
45	1.27	12.77	1.26	12.64	1.26	12.70
60	0.85	12.10	0.82	11.67	0.82	11.65
75	0.44	12.00	0.40	10.96	0.40	10.88

The agreement of the 1908 observations with those of Dunér is remarkably close on the average. This is especially true in the higher latitudes, the very region in which the probability of a variation in the rotation period is mainly in question. Accordingly, we may conclude that the evidence furnished by this comparison is decidedly against the existence of such a variation.

In a discussion, however, advocating the existence of a variation in the sun's rate of rotation, Halm maintains that Dunér's observations themselves furnish evidence of such a variation (9), with a period of about three years In comparing the Edinburgh and Upsala results, Halm has made use of Faye's formula

$$v + v_1 = (a - b \sin^2 \phi) \cos \phi$$

connecting the rotational velocity with the heliographic latitude In this form, as will be shown later, the 1908 observations give

$$v + v_1 = (2.053 - 0.546 \sin^2 \phi) \cos \phi$$

Table 26 contains the values obtained by Halm for the coefficients a and b, with the Mount Wilson values added for comparison

TABLE 26 —COEFFICIENTS OF THE FAYE FORMULA.

OBSERVATIONS	DATE	a	b
Upsala	1899 5	1 98	0 57
	1900 5	2 11	0 40
	1901 5	2 09	0 79
Edinburgh	1901 7	2 06	0 70
	1902 5	1 973	0 560
	1903 5	2 036	0 251
	1904 5	2 075	0.271
	1905 5	2 039	0 245
	1906 3	2 010	0 294
Mount Wilson	1907 0	2 055	0 480
	1908 5	2 053	0 546

The Faye formula, as will appear later, does not fully satisfy the 1906–1907 observations, but the approximation is sufficiently close for the purposes of this comparison

On the basis of a three-year period, with a minimum near 1902 5, it is evident that 1908.5 should also give a minimum value of a Actually, however, it is nearly equal to the largest value obtained by Halm between 1901 and 1906 Moreover, the value of a for 1907 0 is practically identical with that for 1908 5, and decidedly larger than Halm's value for the neighboring epoch 1906 3 Similarly, the Mount Wilson values of b are much larger than would be expected from comparison with the Edinburgh results, and are decidedly opposed to the idea of a periodic variation in this quantity

A third main objection to the conclusion that a real variation of the rotation period is indicated by the differences between the results obtained from the two series of observations is closely connected with the preceding It is the fact that the 1908 observations are well represented by Faye's formula, while the 1906–1907 results show systematic discordances of such size as to necessitate the use of an additional constant in the equation Since the results of Dunér and the mean values obtained by Halm are well represented by this formula, and it has additional support in the observations of the rotation period of sun-spots, it seems improbable that the discordances given by the earlier series of observations can be other than inherent in the results themselves This is indicated by the discussion that follows.

A solution of the 1906–1907 results by least squares, weighting the observations according to their number, gives the following form of Faye's equation·

$$v + v_1 = (1.575 + 0.480 \cos^2 \phi) \cos \phi$$

This equation gives the residuals which appear in the third column of Table 27, the differences being observed − computed

TABLE 27 —REPRESENTATION OF THE 1906–1907 OBSERVATIONS BY EMPIRICAL FORMULÆ

ϕ	WEIGHT	I	II	
		$\Delta(v+v_1)$	$\Delta(v+v_1)$	$\Delta\xi$
°		km	km	°
0.2	21	+0.019	+0.010	+0.10
7.7	15	0.000	−0.007	−0.03
15.0	24	+0.003	+0.001	+0.03
22.7	13	−0.018	−0.014	−0.11
29.8	24	−0.005	+0.005	+0.02
37.8	16	−0.021	−0.008	−0.10
44.6	23	−0.011	0.000	−0.03
52.7	18	−0.001	+0.004	+0.02
59.6	24	+0.009	+0.005	+0.03
65.6	20	+0.010	−0.002	0.00
75.1	33	+0.021	0.000	+0.07
80.4	11	+0.014	−0.008	−0.21

The residuals under I are so clearly systematic in character as to necessitate the addition of a term in $\cos^2\phi$. A solution by least squares with the inclusion of such a term gives the equation

$$v + v_1 = (1.791 - 0.621 \cos\phi + 0.894 \cos^2\phi) \cos\phi$$

The corresponding equation for the angular velocity is

$$\xi = 12^\circ.43 - 3^\circ.48 \cos\phi + 5^\circ.68 \cos^2\phi$$

The equations for $v + v_1$ and ξ are derived independently and so are not convertible into one another by a substitution These equations give the residuals under II in Table 27, which evidently are not systematic in character A similar solution for the 1908 observations indicates that these are satisfied by the Faye equation with sufficient accuracy The formulæ in this case are found to be

$$v + v_1 = (1.507 + 0.546 \cos^2\phi) \cos\phi \qquad \xi = 10^\circ.57 + 4^\circ.04 \cos^2\phi$$

The corresponding residuals are shown in Table 28

In the highest latitudes the angular velocity changes very rapidly with the linear, which of course accounts for the large value of the discordance in ξ at $79^\circ.1$ This point is of low weight The residual at $44^\circ.8$ is surprisingly large for a point of such high weight In view of the simple character of the formula, however, the size of the residuals is in general entirely satisfactory

A comparison of the last formula with the corresponding equations of Dunér and Halm will be of interest These are as follows

Dunér	$\xi = 10^\circ.60 + 4^\circ.21 \cos^2\phi$
Halm	$\xi = 12.03 + 2.50 \cos^2\phi$
Adams (1908)	$\xi = 10.57 + 4.04 \cos^2\phi$

The agreement of the first term in the formulæ of Dunér and myself is remarkable, but probably is somewhat accidental It represents, of course, the angular velocity of rotation at the sun's pole, and corresponds to a rotation period of 34.0 days

In addition to solving each series of observations separately, I have obtained a mean result for the two sets by combining the values for closely adjoining points of latitude and solving these values by least squares with an equation of Faye's form Equal weights have been assigned to the two series in the formation of the means and the values then weighted in the solution according to the number of observations The results are as follows

$$v + v_1 = (1.550 + 0.501 \cos^2\phi) \cos\phi \qquad \xi = 11^\circ.04 + 3^\circ.50 \cos^2\phi$$

Table 29 contains the values on which the solution is based, and the residuals (observed − computed) which are given by these two formulæ These residuals are small in amount, and there appears to be no tendency to systematic effect in sign This result evidently is due largely to the smoothing-out effect of the 1908 observations

TABLE 28 — REPRESENTATION OF 1908 OBSERVATIONS BY FAYE'S FORMULA

ϕ	WEIGHT	$\Delta(v+v_1)$	$\Delta\xi$
°		km	°
0 4	21	+ 0 009	+ 0 03
4 1	15	− 0 005	− 0 06
11 2	12	− 0 002	− 0 06
14 9	18	− 0 005	− 0 06
19 2	14	− 0 016	− 0 13
29 8	16	+ 0 004	+ 0 04
34 1	15	0 000	+ 0 01
44 8	17	+ 0 023	+ 0 28
49 6	16	+ 0 011	+ 0 18
60 1	22	− 0 012	− 0 08
65 0	17	− 0 006	− 0 01
75 0	17	− 0 003	+ 0 02
79 1	7	− 0 016	− 0 46

TABLE 29 — REPRESENTATION OF MEAN RESULTS FOR 1906–1907 AND 1908 BY FAYE'S FORMULA

ϕ	$v+v_1$	$\Delta(v+v_1)$	$\Delta\xi$
°	km	km	°
0 3	2 068	+ 0 017	+ 0 13
7 6	2 019	− 0 004	− 0 02
15 0	1 950	+ 0 001	+ 0 02
20 9	1 839	− 0 017	− 0 12
29 8	1 672	− 0 001	0 00
35 9	1 509	− 0 011	− 0 11
44 7	1 285	+ 0 004	+ 0 03
51 2	1 099	+ 0 003	+ 0 02
59 9	0 836	− 0 005	− 0 09
65 3	0 683	− 0 001	− 0 04
75 0	0 416	+ 0 008	+ 0 17
79 8	0 275	− 0 003	− 0 14

14 PROBABLE ERRORS

A comparison of the probable errors of the results of these determinations with the visual observations of Dunér and Halm is rendered rather difficult by the inherent difference in the nature of the methods employed The photographic results are based upon the measurement of a considerable number of lines, the mean values of which are combined to give a single determination of the rotational velocity. In the work of Dunér and Halm only two lines were used, but from eight to twelve settings of the micrometer wire were made upon each line In the case of the photographic determinations four settings were made in each position of the plate under the measuring microscope It will be sufficient for general purposes to compare the probable error for a single line on the photographic plate with the probable error for a single visual determination, taken from a series equal in number to the lines on the photographic plate This should give a marked advantage to the visual results, since the mean of two lines is used, and a large number of settings employed on each of them. In the case of the photographic observations, however, such of the lines as give marked systematic deviations should evidently be omitted when the probable error is formed Accordingly, six lines of this sort, the behavior of which has already been fully discussed, namely, λ 4196, λ 4197, λ 4216, λ 4257, λ 4266, and λ 4290 38, are left out of consideration This leaves a total of fourteen lines for the 1906–1907 series and sixteen for the 1908 series Plates taken at random from each set give the following values ·

	SINGLE LINE	MEAN VALUE FROM PLATE
1906–1907 . .	$r = \pm$ 0 015 km	$r_0 = \pm$ 0.004 km
1908 . . .	$r = \pm$ 0 009	$r_0 = \pm$ 0 002

A series of determinations by Halm in 1903 (8) averaging fifteen observations for each latitude give

$$r = \pm 0\ 070 \text{ km} \qquad r_0 = \pm 0\ 018 \text{ km}$$

The earlier series of observations by Dunér show probable errors about twice as large as those of Halm, but for the completed series no values are given, though they are undoubtedly considerably smaller than for the previous results It should be noted that the photographic observations show somewhat larger probable errors in the higher latitudes

A comparison of these values indicates a marked gain in the degree of accuracy of the photographic results over the visual It is of course impossible to state how much of this gain is due to the more powerful spectroscopic apparatus and the larger solar image employed, and how much to the use of the photographic method, but it seems probable that both facts contribute materially to the result

15. Comparison of Results for Sun-spots, Faculæ, Flocculi, Reversing Layer, the α Line of Hydrogen, and λ 4227 of Calcium

At the conclusion of this discussion of the rotation of the sun as determined from the displacements of the lines in the reversing layer, it seems desirable to add a comparison with the values obtained by various observers from sun-spots, faculæ, and hydrogen and calcium flocculi Such a comparison with the reversing layer results of Dunér and Halm has already been made by Hale and Fox in their discussion of the motion of the calcium flocculi (19), and by Hale in his paper on the motion of the hydrogen flocculi (20) In view of the additional material now available for the reversing layer, a repetition of these values will not be out of place The quantities, which are given in Table 30, are derived from empirical formulæ where these have been obtained, in other cases they are taken from curves or found by interpolation from the original observations In the case of the work of Carrington, Spoerer, and Maunder on sun-spots, Dunér and Halm on the reversing layer, and Adams on the reversing layer, $H\alpha$ and λ 4227, empirical formulæ are available. In the form employed for calculation they are as follows

Carrington	$\xi = 14^{\circ}42 - 2^{\circ}75 \sin^{\frac{7}{4}} \phi$
Spoerer	$\xi = 8\ 55 + 5\ 80 \cos \phi$
Maunder	$\xi = 12\ 43 + 2\ 01 \cos^2 \phi$
Dunér	$\xi = 10\ 60 + 4\ 21 \cos^2 \phi$
Halm	$\xi = 12\ 03 + 2\ 50 \cos^2 \phi$
Adams (mean of two series)	$\xi = 11\ 04 + 3\ 50 \cos^2 \phi$
Adams λ 4227	$\xi = 12\ 5 + 2\ 4 \cos^2 \phi$
Adams $H\alpha$	$\xi = 13\ 6 + 1\ 4 \cos^2 \phi$

Table 30 — Comparison of Rotation Results from Various Sources

ϕ	Sun-spots			Faculæ	Calcium Flocculi			Hydrogen Flocculi	Reversing Layer			λ 4227	$H\alpha$
	Carrington	Spoerer	Maunder	Stratonoff	Hale and Fox (Kenwood)	Fox	Hale, Mount Wilson	Mount Wilson	Dunér	Halm	Adams, Two Series	Adams.	Adams
°	°	°	°	°	°	°	°	°	°	°	°	°	°
0	14 42	14 35	14 44	14 62	14 70	14 52	14 42	14 6	14 81	14 53	14 54	14 9	15 0
5	14 38	14 32	14 43	14 61	14 59	14 46	14 38		14 78	14 50	14 51		
10	14 29	14 26	14 38	14 46	14 44	14 33	14 32		14 68	14 46	14 43		
15	14 16	14 15	14 30	14 24	14 30	14 09	14 28		14 53	14 37	14 31	14 8	14 9
20	14 00	14 00	14 19	14 18	14 17	13 80	14 27		14 32	14 24	14 13		
25	13 81	13 80	14 06	14 14	14 02	13 82	14 17		14 06	14 09	13 91		
30	13 60	13 57	13 91	13 84	13 83	13 83	13 98		13 76	13 90	13 67	14 3	14 6
35	13 38	13 30	13 74				14 04		13 42	13 70	13 39		
40							13 92		13 07	13 50	13 09		
45									12 70	13 28	12 79	13 7	14 3
50									12 34	13 07	12 49		
55									11 99	12 86	12 19		
60									11 65	12 66	11 92	13 1	13 9
65									11 35	12 48	11 67		
70									11 09	12 32	11 45		
75									10 88	12 20	11 27	12 7	13 7

As has already been stated, my own 1908 observations agree closely with Dunér's in the higher latitudes, but are smaller and nearer Halm's values in the lower latitudes In Table 31 I have taken simple means for the spot and flocculi results and compared them with the values obtained from my two series of observations on the reversing layer They are shown graphically in Fig 2

TABLE 31 — SUMMARY OF ROTATION RESULTS FROM VARIOUS SOURCES

φ	SPOTS	FACULÆ	FLOCCULI	REVERSING LAYER
°	°	°	°	°
0	14 40	14 62	14 55	14 54
5	14 38	14 61	14 48	14 51
10	14 31	14 46	14 36	14 43
15	14 20	14 24	14 22	14 31
20	14 06	14 18	14 08	14 13
25	13 89	14 14	14 00	13 91
30	13 69	13 84	13 88	13 67
35	13 47		13 81	13 39

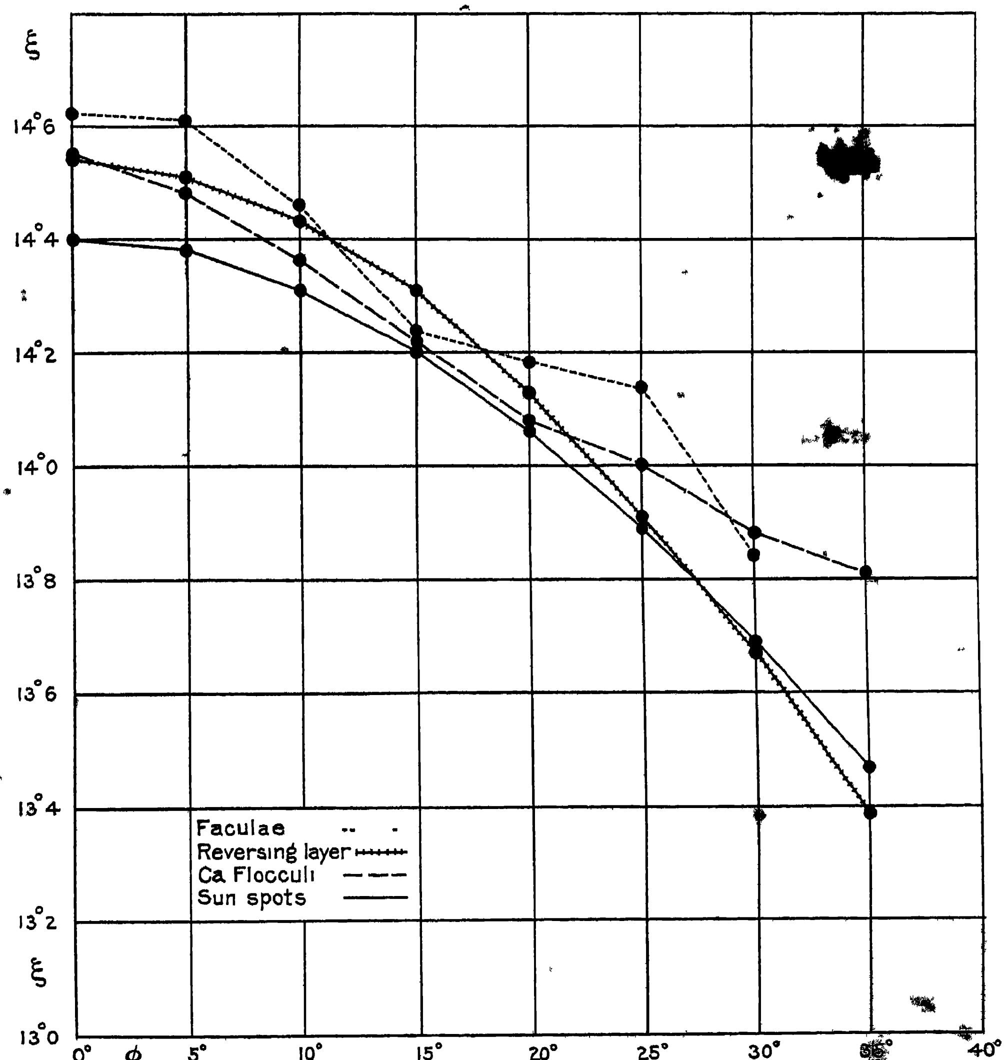


FIG 2 — Curves showing the values of the angular velocity obtained from observations of sun-spots, faculæ, calcium flocculi, and reversing layer Plotted from the results given in Table 31

16 A Case of Large Proper Motion in the Reversing Layer

Reference was made at an earlier point in this discussion to the disturbing effect of proper motions in the reversing layer upon determinations of rotational velocity Such motions have frequently been observed in the neighborhood of sun-spots, particularly across the faculæ bordering the penumbra, but it appears from the observations described below that they may extend to great distances from spots as well

On September 15, 1908, two spots of considerable size were nearing the west limb of the sun The larger of the two spots was at 11° north latitude, the other at 6° south latitude Photographs taken with the spectroheliograph through the *a* line of hydrogen had shown both spots to be surrounded by immense regions of disturbance, with the filaments nearest the spots giving some evidence of vortical motion Observations made by Mr Hale during the passage of the spots across the sun's disk had indicated opposite directions of polarization for the components of the double lines in the spot spectia, thus pointing to opposite directions of rotation in the two spots, provided vortical motion were involved The region between

TABLE 32 —OBSERVATIONS OF PROPER MOTION IN THE REVERSING LAYER

Plate ω 173 1908, Sept 15, $6^h 5^m$ G M T Measured by L on T Distance from Limb 1 5 mm Quality, good

		$p-P$	π	ϕ	η	sec η
	°	°	°	°	°	
O	172 5	12 8	14 7	75 3	29 6	1 150
O−Ω	98 0	26 4	27 2	62 8	14 4	1 032
P	−24 4	44 8	45 3	44 7	10 1	1 016
D	7 2	59 9	60 2	29 8	8 3	1 010
Diameter	170 6 mm	74 9	75 1	14 9	7 4	1 008
Factor	1 018	89 9	90 0	0 0	7 2	1 008

λ	$\phi = 0°0$				$\phi = 14°9$				$\phi = 29°8$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4208 766	0 165	1 805	1 942	13 79	0 162	1 775	1 907	14 01	0 140	1 535	1 655	13 54
4210 494	0 165	1 805	1 942	13 79	0 164	1 794	1 926	14 14	0 140	1 535	1 655	13 54
4216 136	0 162	1 770	1 907	13 54	0 162	1 768	1 900	13 95	0 140	1 533	1 653	13 52
4220 509	0 163	1 779	1 916	13 60	0 163	1 777	1 909	14 02	0 140	1 531	1 651	13 51
4222 382	0 165	1 798	1 935	13 74	0 162	1 766	1 898	13 94	0 140	1 530	1 650	13 50
4233 328	0 164	1 775	1 912	13 57	0 163	1 769	1 901	13 96	0 142	1 541	1 661	13 59
4236 112	0 164	1 775	1 912	13 57	0 163	1 768	1 900	13 95	0 142	1 541	1 661	13 59
4246 251	0 165	1 783	1 920	13 63	0 163	1 766	1 898	13 94	0 140	1 518	1 638	13 40
4250 287	0 165	1 781	1 918	13 62	0 161	1 741	1 873	13 76	0 141	1 528	1 648	13 48
4250 945	0 164	1 770	1 907	13 54	0 163	1 762	1 894	13 91	0 140	1 517	1 637	13 39
4254 505	0 167	1 802	1 939	13 77	0 160	1 729	1 861	13 67	0 137	1 483	1 603	13 11
4257 815	0 162	1 747	1 884	13 38	0 163	1 760	1 892	13 90	0 139	1 504	1 624	13 29
	$\phi = 44°7$				$\phi = 62°8$				$\phi = 75°3$			
4208 766	0 104	1 146	1 242	12 41	0 059	0 660	0 729	11 32	0 029	0 363	0 397	11 11
4210 494	0 104	1 146	1 242	12 41	0 058	0 650	0 719	11 17	0 028	0 351	0 385	10 77
4216 136	0 105	1 155	1 241	12 40	0 059	0 660	0 729	11 32	0 028	0 351	0 385	10 77
4220 509	0 106	1 163	1 259	12 57	0 058	0 645	0 714	11 09	0 028	0 351	0 385	10 77
4222 382	0 104	1 142	1 238	12 36	0 059	0 655	0 724	11 24	0 030	0 373	0 407	11 39
4233 328	0 107	1 168	1 264	12 62	0 059	0 655	0 724	11 24	0 029	0 359	0 393	11 00
4236 112	0 107	1 167	1 263	12 61	0 060	0 665	0 734	11 40	0 029	0 359	0 393	11 00
4246 251	0 105	1 146	1 242	12 40	0 058	0 644	0 713	11 07	0 028	0 346	0 380	10 63
4250 287	0 104	1 135	1 231	12 30	0 058	0 643	0 712	11 06	0 028	0 346	0 380	10 63
4250 945	0 107	1 165	1 261	12 59	0 059	0 653	0 722	11 21	0 029	0 358	0 392	10 97
4254 505	0 106	1 154	1 250	12 48	0 058	0 642	0 711	11 04	0 028	0 345	0 379	10 60
4257 815	0 104	1 131	1 227	12 26	0 060	0 663	0 732	11 37	0 028	0 344	0 378	10 58

the spots was in an extremely chaotic state, owing probably to the intermingling of the disturbances centered about the two spots

Four plates of the region of the spectrum near λ 4227 were taken on this date with the rotation apparatus at latitudes ranging from 0° to 75°, in steps differing by 15°. Accordingly, for one of the settings at 0°, a point 6° north of one of the spots fell upon the slit of the instrument, for another, at latitude 14°9, a point 4° north of the other spot In the first case the point fell considerably east of the spot as well All of the plates were taken in connection with the investigation of the motion of the calcium vapor giving rise to λ 4227, and their density was made greater than usual in order to facilitate settings upon this broad and hazy line

As soon as the measurement of the plates was begun, it was found that the values at latitudes 0° and 14°9 were very discordant, when compared with those regularly obtained Therefore a list of lines suitable for measurement was selected, since the regular list could not be used on account of the great density of the negatives, and the plates were investigated separately The results for these lines are shown in detail in Table 32 The results for λ 4227 are given in Table 33

TABLE 32 — OBSERVATIONS OF PROPER MOTION IN THE REVERSING LAYER — Continued

Plate ω 174 1908, Sept 15, $6^h 5^m$ G M T Measured by L on T Distance from Limb 1 5 mm Quality, good

[Plate constants are the same as for ω 173]

λ	$\phi = 0°0$				$\phi = 14°9$				$\phi = 29°8$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4208 766	0 161	1 762	1 899	13 47	0 160	1 750	1 882	13 83	0 140	1 543	1 663	13 60
4210 494	0 162	1 772	1 909	13 55	0 161	1 761	1 893	13 91	0 141	1 553	1 673	13 69
4216 136	0 161	1 757	1 894	13 45	0 162	1 770	1 902	13 97	0 141	1 543	1 663	13 60
4220 509	0 162	1 766	1 903	13 51	0 160	1 745	1 877	13 79	0 140	1 530	1 653	13 52
4222 382	0 163	1 776	1 913	13 58	0 162	1 766	1 898	13 94	0 142	1 551	1 671	13 67
4233 328	0 162	1 758	1 895	13 45	0 161	1 749	1.881	13 82	0 142	1 538	1 658	13 56
4236 112	0 162	1 757	1 894	13 44	0 162	1 759	1 891	13 89	0 142	1 538	1 658	13 56
4246 251	0 162	1 752	1 889	13 41	0 161	1 743	1 875	13 77	0 142	1 537	1 657	13 56
4250 287	0 161	1 740	1 877	13 33	0 161	1 740	1 872	13 75	0 140	1 515	1 635	13 38
4250 945	0 166	1 794	1 931	13 71	0 162	1 749	1 881	13 82	0 141	1 525	1 645	13 46
4254 505	0 162	1 749	1 886	13 39	0 160	1 729	1 861	13 67	0 142	1 536	1 656	13 55
4257 815	0 163	1 758	1 895	13 45	0 162	1 748	1 880	13 81	0 141	1 525	1 645	13 46

λ	$\phi = 44°7$				$\phi = 62°8$				$\phi = 75°3$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
4208 766	0 103	1 134	1 230	12 29	0 059	0 659	0 728	11 31	0 030	0 374	0 408	11.41
4210 494	0 102	1 124	1 220	12 19	0 059	0 659	0 728	11 31	0 030	0 374	0 408	11 41
4216 136	0 105	1 141	1 237	12 36	0 059	0 658	0 727	11 29	0 030	0 373	0 407	11 39
4220 509	0 103	1 131	1 227	12 26	0 060	0 668	0 737	11 45	0 030	0 373	0 407	11 39
4222 382	0 104	1 141	1 237	12 36	0 060	0 668	0 737	11 45	0 030	0 373	0 407	11 39
4233 328	0 103	1 124	1 220	12 19	0 059	0 654	0 723	11 23	0 031	0 380	0 414	11 58
4236 112	0 106	1 159	1 255	12 54	0 060	0 664	0 733	11 38	0 032	0 393	0 427	11 95
4246 251	0 103	1 122	1 218	12 17	0 061	0 675	0 744	11 56	0 031	0 380	0 414	11 58
4250 287	0 104	1 132	1 228	12 26	0 060	0 663	0 732	11 37	0 029	0 357	0 391	10 94
4250 945	0 105	1 141	1 237	12 36	0 060	0 663	0 732	11 37	0 029	0 357	0.391	10.94
4254 505	0 105	1 141	1 237	12 36	0 059	0 653	0 722	11 21	0 032	0 392	0 426	11.92
4257 815	0 105	1 141	1 237	12 36	0 060	0 663	0 732	11 37	0 030	0 369	0.403	11.27

TABLE 32 — OBSERVATIONS OF PROPER MOTION IN THE REVERSING LAYER — Continued

Plate ω 175 1908, Sept 15, 7^h 10^m G M T Measured by L on T Distance from Limb 1 5 mm Quality, good

[Plate constants are the same as for ω 173]

λ	$\phi = 0°0$				$\phi = 14°9$				$\phi - 29°8$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4208 766	0 168	1 836	1 973	14 01	0 163	1 785	1 917	14 08	0 141	1 547	1 667	13 64
4210 494	0 166	1 815	1 952	13 86	0 164	1 794	1 926	14 15	0 141	1 540	1 666	13 63
4216 136	0 166	1 813	1 950	13 84	0 163	1 782	1 914	14 06	0 142	1 553	1 673	13 69
4220 509	0 166	1 812	1 949	13 84	0 164	1 789	1 921	14 11	0 141	1 543	1 663	13 61
4222 382	0 168	1 830	1 967	13 96	0 164	1 788	1 920	14 10	0 142	1 551	1 671	13 67
4233 328	0 167	1 813	1 950	13 84	0 164	1 782	1 914	14 06	0 142	1 546	1 666	13 63
4236 112	0 169	1 833	1 970	13 99	0 165	1 791	1 923	14 13	0 142	1 544	1 664	13 63
4246 251	0 172	1 855	1 992	14 14	0 164	1 774	1 906	14 00	0 142	1 542	1 662	13 62
4250 287	0 166	1 794	1 931	13 71	0 163	1 762	1 894	13 91	0 142	1 539	1 659	13 57
4250 945	0 167	1 803	1 940	13 77	0 164	1 772	1 904	13 99	0 142	1 537	1 657	13 56
4254 505	0 168	1 813	1 950	13 84	0 164	1 771	1 903	13 98	0 143	1 546	1 666	13 63
4257 815	0 167	1 802	1 939	13 77	0 165	1 781	1 917	14 05	0 142	1 536	1 656	13 55
	$\phi = 44°7$				$\phi = 62°8$				$\phi = 75°3$			
4208 766	0 102	1 123	1 219	12 18	0 058	0 650	0 719	11 17	0 028	0 349	0 383	10 72
4210 494	0 101	1 113	1 209	12 08	0 060	0 669	0 738	11 46	0 027	0 339	0 373	10 44
4216 136	0 102	1 122	1 218	12 17	0 059	0 659	0 728	11 31	0 028	0 349	0 383	10 72
4220 509	0 102	1 121	1 217	12 16	0 058	0 648	0 717	11 14	0 027	0 338	0 372	10 41
4222 382	0 102	1 120	1 216	12 14	0 058	0 648	0 717	11 14	0 028	0 348	0 382	10 69
4233 328	0 103	1 121	1 217	12 16	0 059	0 653	0 722	11 21	0 028	0 346	0 380	10 63
4236 112	0 103	1 121	1 217	12 16	0 059	0 653	0 722	11 21	0 027	0 336	0 370	10 35
4246 251	0 102	1 110	1 206	12 05	0 058	0 642	0 711	11 04	0 027	0 335	0 369	10 32
4250 287	0 102	1 110	1 206	12 05	0 058	0 642	0 711	11 04	0 028	0 346	0 380	10 63
4250 945	0 104	1 130	1 226	12 24	0 057	0 632	0 701	10 89	0 028	0 346	0 380	10 63
4254 505	0 104	1 130	1 226	12 24	0 060	0 663	0 732	11 37	0 028	0 346	0 380	10 63
4257 815	0 102	1 108	1 204	12 03	0 057	0 630	0 699	10 86	0 027	0 335	0 369	10 32

Plate ω 176 1908, Sept 15, 7^h 10^m G M T Measured by L on T Distance from Limb 1 5 mm Quality, good

[Plate constants are the same as for ω 173]

λ	$\phi = 0°0$				$\phi = 14°9$				$\phi = 29°8$			
	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ	Δ	v	$v+v_1$	ξ
		km	km	°		km	km	°		km	km	°
4208 766	0 166	1 816	1 953	13 87	0 163	1 784	1 916	14 08	0 142	1 555	1 675	13 70
4210 494	0 165	1 805	1 942	13 79	0 163	1 783	1 915	14 07	0 143	1 565	1 685	13 79
4216 136	0 166	1 812	1 949	13 84	0 163	1 780	1 912	14 04	0 142	1 553	1 673	13 69
4220 509	0 166	1 811	1 948	13 83	0 164	1 789	1 921	14 11	0 141	1 542	1 662	13 60
4222 382	0 167	1 820	1 957	13 89	0 163	1 777	1 909	14 02	0 142	1 551	1 671	13 67
4233 328	0 166	1 803	1 940	13 77	0 163	1 771	1 903	13 98	0 142	1 544	1 664	13 61
4236 112	0 167	1 809	1 946	13 82	0 165	1 790	1 922	14 12	0 142	1 543	1 663	13 61
4246 251	0 168	1 817	1 954	13 88	0 163	1 768	1 900	13 96	0 143	1 552	1 672	13 68
4250 287	0 168	1 816	1 953	13 87	0 163	1 763	1 895	13 92	0 142	1 538	1 658	13 56
4250 945	0 169	1 824	1 961	13 92	0 164	1 771	1 903	13 98	0 142	1 537	1 657	13 56
4254 505	0 168	1 813	1 950	13 85	0 163	1 759	1 891	13 89	0 143	1 546	1 666	13 63
4257 815	0 167	1 802	1 939	13 77	0 162	1 748	1 880	13 81	0 142	1 536	1 656	13 55
	$\phi = 44°7$				$\phi = 62°8$				$\phi = 75°3$			
4208 766	0 102	1 125	1 221	12 20	0 059	0 662	0 731	11 35	0 028	0 351	0 385	10 77
4210 494	0 104	1 146	1 242	12 40	0 060	0 672	0 741	11 51	0 029	0 363	0 397	11 11
4216 136	0 103	1 134	1 230	12 28	0 060	0 671	0 740	11 49	0 030	0 374	0 408	11 41
4220 509	0 102	1 121	1 217	12 16	0 059	0 660	0 729	11 32	0 029	0 359	0 393	11 00
4222 382	0 102	1 120	1 216	12 14	0 060	0 669	0 729	11 32	0 028	0 348	0 382	10 69
4233 328	0 103	1 127	1 223	12 22	0 059	0 656	0 725	11 26	0 029	0 347	0 381	10 66
4236 112	0 103	1 126	1 222	12 20	0 058	0 644	0 713	11 07	0 030	0 357	0 391	10 94
4246 251	0 102	1 114	1 210	12 09	0 058	0 643	0 712	11 05	0 028	0 346	0 380	10 63
4250 287	0 103	1 121	1 217	12 16	0 060	0 663	0 732	11 37	0 029	0 346	0 380	10 63
4250 945	0 102	1 110	1 206	12 05	0 060	0 662	0 731	11 35	0 030	0 356	0 390	10 91
4254 505	0 103	1 120	1 216	12 15	0 059	0 652	0 721	11 20	0 028	0 345	0 379	10 60
4257 815	0 102	1 110	1 206	12 05	0 058	0 642	0 711	11 03	0 028	0 345	0 379	10 60

The combination of these results gives the values of $v + v_1$ shown in Table 33, the normal values in each case being added for comparison The latter are from the 1908 observations

TABLE 33 —PROPER MOTION IN THE REVERSING LAYER

ϕ	Reversing Layer		λ 4227	
	Disturbed	Normal	Disturbed.	Normal
°	km	km	km	km
0 0	1 930	2 063	2 01	2 12
14 9	1 899	1 944	1 97	2 02
29 8	1 666	1 669	1 73	1 75
44 7	1 240	1 289	1 31	1 36
62 8	0 724	0 740	0 84	0 82
75 3	0 389	0 387	0 48	0 49

At latitude 30° and above that point it is seen that the results obtained from these plates agree fairly well with the normal, although the differences at latitude 44°7 are unusually large At 14°9, however, there is a difference of 0 045 km for the reversing layer, and at 0° a difference of 0 133 km, the values given by these plates being the smaller The results for λ 4227 are very similar In other words, proper motions of the reversing layer toward the observer at the west limb of the sun of 0 05 km in one case and 0 13 km in the other are indicated, if we assume, as seems altogether probable, that the entire difference is due to the disturbances near the west limb The direction of motion at the first of these points, 14°9, is in accordance with what would be expected if vortical motion occurred in the northern spot in the direction indicated by polarization observations and photographs with the spectroheliograph These point to a direction of motion counter-clockwise as seen from above Accordingly, at a point north of this spot, the motion would be toward the observer, and the rotational velocity reduced

In the case of the second spot an opposite direction of motion is indicated by polarization observations, and we should accordingly expect, for a point north of this spot, motion away from the observer This is opposed to what is found It is doubtful, however, whether this lack of agreement is more than apparent The slit setting in this case was 6° away from the spot, and considerably east of it as well It also fell on a greatly disturbed region between the two spots, where it is by no means certain that any well-defined direction of motion would predominate. In any case it is clear that a large amount of observational material would be necessary to settle the question of vortical motion about spots by means of spectroscopic observations of the reversing layer, since the quantities involved are considerably smaller than would be expected, provided any definite motion of this sort, in which the reversing layer shares, actually exists

The important fact as bearing on observations of the rotation of the sun is that large areas on the solar surface may be affected with proper motions of such size as to introduce very serious errors into the results when the areas happen to fall near the sun's limb It seems very probable that the regions of greatest disturbance, where the proper motions would be largest, are associated with spots; but observations with the spectroheliograph have shown that such disturbances may also exist where there are no spots. Furthermore, an investigation by myself of the small pressure displacements at the sun's limb has led to the conclusion that regions are sometimes found near the center of the sun in which there are ascending currents in the reversing layer, showing motions of as much as 0 2 km It is very probable that these regions may have a lateral drift as well, in which case they would affect seriously observations of the rotation of the sun

The possible bearing of these results on the two series of observations for 1906–1907 and 1908 has already been noted Although we should expect differences arising from this cause to be greatest in the zones of spot activity, yet the existence of a few cases of proper motion in the higher latitudes might well affect the rotational values materially, since the observations are not sufficiently numerous to eliminate their effect.

A similar cause may perhaps account in part for the difference found by Halm between the two series of observations, 1901–1902 and 1903. In such a case the differences would represent rather the excess of the

effect of systematic proper motions in one series over that for the other than any real variation in the sun's rate of rotation. The year 1903 was characterized by much greater spot activity than were the two preceding years. Accordingly, it might well happen that if the spots were accompanied by large areas of disturbance, and the points observed did not chance to be symmetrically distributed about them, the average results might be affected by systematic differences. The whole question is doubtful, however, and the main inference to be drawn is that in taking observations to determine the rotation of the sun, regions as free as possible from disturbances should be selected and as large a number of observations as possible be made, in order to reduce the effect of systematic proper motions.

17. Determination of the Solar Rotation with the α Line of Hydrogen

The details of the observations on the α line of hydrogen at the sun's limb and at points averaging 3 mm inside the limb have been given in Tables 15–18 in Part I of this discussion. If we collect the values and form normal places of latitude for the two series, we obtain Table 34.

Table 34.—Mean Results for the α Line of Hydrogen

At Limb				3 mm Inside Limb			
ϕ	$v+v_1$	ξ	Period	ϕ	$v+v_1$	ξ	Period
°	km	°	days	°	km	°	days
0.5	2.14	15.2	23.7	0.4	2.11	15.0	24.0
14.6	2.03	14.9	24.2	14.6	2.00	14.7	24.5
29.5	1.78	14.5	24.8	29.8	1.73	14.1	25.5
44.6	1.41	14.0	25.7	45.0	1.38	13.8	26.1
59.9	0.95	13.5	26.7	60.3	0.90	13.0	27.7
75.0	0.52	14.2	25.4	75.5	0.47	13.3	27.1

A comparison of the results in Table 34 shows that the rate of change of the motion is very rapid inward from the limb, and that the points nearer the edge give not only larger absolute values, but also less change of velocity with change of latitude. An effect of this sort would seem very probable from the consideration that the level of effective absorption for points near the limb in the case of an element like hydrogen is probably decidedly higher than that for points inside the limb. Direct evidence of this, although not of very high weight, was furnished by the results obtained from some plates taken so close to the limb that upon two of them the bright chromospheric line was shown. These plates gave very large values throughout, and essentially no evidence of change of angular velocity with latitude.

Table 35.—Comparison of Results for α Line of Hydrogen with those for Reversing Layer

ϕ	$H\alpha$ at Limb			$H\alpha$ 3 mm Inside Limb			Reversing Layer		
	$v+v_1$	ξ	Period	$v+v_1$	ξ	Period	$v+v_1$	ξ	Period
°	km	°	days	km	°	days	km	°	days
0.5	2.14	15.2	23.7	2.11	15.0	24.0	2.06	14.6	24.6
14.6	2.03	14.9	24.2	2.00	14.7	24.5	1.95	14.3	25.2
29.5	1.78	14.5	24.8	1.73	14.1	25.5	1.67	13.7	26.4
44.6	1.41	14.0	25.7	1.39	13.8	26.0	1.29	12.9	27.9
59.9	0.95	13.5	26.7	0.92	13.0	27.8	0.81	11.5	31.3
75.0	0.52	14.2	25.4	0.48	13.3	27.1	0.40	10.9	33.1

In order to compare the results of the two series on the α line of hydrogen with each other and with those given by the reversing layer, the values in Table 34 are reduced to the same latitude and collected in Table 35 along with the reversing layer results. The latter are from the 1908 observations.

An inspection of the results in Table 35 leads to two important conclusions. First, that the absolute velocity of rotation given by $H\alpha$ is much higher than that found for the reversing layer. Second, that the law of change of angular velocity with latitude is quite different, the velocity being more nearly uniform, or the equatorial acceleration less, than in the case of the reversing layer.

As has been stated previously, it seems probable that the explanation of these results is to be found in the comparatively high level occupied by hydrogen gas in the sun's atmosphere. The change of angular velocity with latitude which, as we have seen, appears to be most rapid for the reversing layer, sun-spots, and faculæ, is almost certainly connected to some extent with the effects of internal friction. This friction no doubt decreases outward from the photosphere, with the result that for the higher gases the tendency is toward a more nearly uniform rate of rotation in all latitudes. Similarly, as the effect of friction is reduced, the higher gases tend to acquire greater velocities, the tendency toward orbital motion gradually becoming stronger. It would of course be necessary to go to immense distances from the sun, certainly beyond the corona, before the motion could in any sense be considered truly orbital, but a tendency in this direction might well begin at a comparatively low level. It is of interest to note in this connection that Campbell's result for the rotation of the corona indicates a very short period. Thus Campbell writes (22):

The difference of the determinations for the E. and W. sides is 0.11 t.m. (Ångstrom), corresponding to a relative velocity in the line of sight for the two sides of 6.2 km, and a rotational velocity of 3.1 km. per second. However, I regard this last result as subject to a possible error of at least ± 2 km per second, partly on account of unavoidable errors of observation, but principally on account of the character of the bright line.

A linear rotational velocity of 3.2 km corresponds to a daily angular motion of about 22°.7, or to a period of rotation of 15.9 days. It seems probable from the $H\alpha$ results that at the level of even the lowest parts of the corona very little equatorial acceleration would be found.

The marked difference in the behavior of $H\alpha$ at the sun's limb as compared with the violet lines of the hydrogen series makes it probable that a difference in the level of effective absorption is involved. Accordingly, I have made a few attempts to measure the rotational velocity given by the $H\gamma$ line. The results appear to indicate that $H\gamma$ gives values averaging about 0.05 km less than $H\alpha$, but they are of extremely low weight on account of the difficulty of measurement of this line. The recent studies by Hale and Ellerman of the hydrogen flocculi photographed with the different lines of the hydrogen series would indicate that some such effect might be expected (23).

18. Determination of the Solar Rotation with λ 4227 of Calcium

The details of the observations on the line λ 4227 of calcium and summaries of the results are given in Tables 19 and 20 of Part I. If we combine the values about normal points of latitude, we obtain the results found in Table 36. The reversing layer values from the observations of 1908 are added for comparison.

Table 36.—Comparison of Results for λ4227 of Calcium with those for Reversing Layer

ϕ	λ 4227			Reversing Layer		
	$v+v_1$	ξ	Period	$v+v_1$	ξ	Period
°	km	°	days	km	°	days
0.4	2.12	15.1	23.8	2.06	14.6	24.6
15.0	2.02	14.8	24.3	1.94	14.3	25.2
29.9	1.75	14.3	25.2	1.67	13.6	26.4
44.9	1.36	13.6	26.5	1.29	12.9	28.0
60.0	0.88	12.5	28.8	0.81	11.5	31.3
74.8	0.49	13.3	27.1	0.40	10.9	33.0

These results indicate that the calcium gas producing λ 4227, like hydrogen, moves more rapidly than the reversing layer, and shows less change of velocity with increasing latitude. The differences are less,

however, than for hydrogen near the limb, and approximately equal to those for hydrogen taken at a distance of 3 mm inside the limb

An investigation of two calcium lines in the less refrangible part of the spectrum has been made by Pérot with interference apparatus (17) Preliminary values of the angular velocity given by him are as follows

λ	$\phi = 0^\circ$	$\phi = 45^\circ 7$
5349 6 6122 4	15 1 14 7	14 2 14 2
Mean	14 9	14 2

At the equator these results are identical with those obtained here for λ 4227, but at 45° they are considerably larger They may, of course, be modified considerably by more complete results, but it seems doubtful whether the entire difference will disappear If it persists, it would seem to indicate a higher average level for these lines than for λ 4227 The broad wings of the latter line point to a region of considerable density and consequently of low level for their origin, but there can be but little doubt that the central portion of the line rises to a considerable altitude Moreover, the size of pressure displacements found for the two less refrangible lines at the sun's limb would appear to argue against a very high level origin (24) All three of the lines are found in the spectrum of the chromosphere

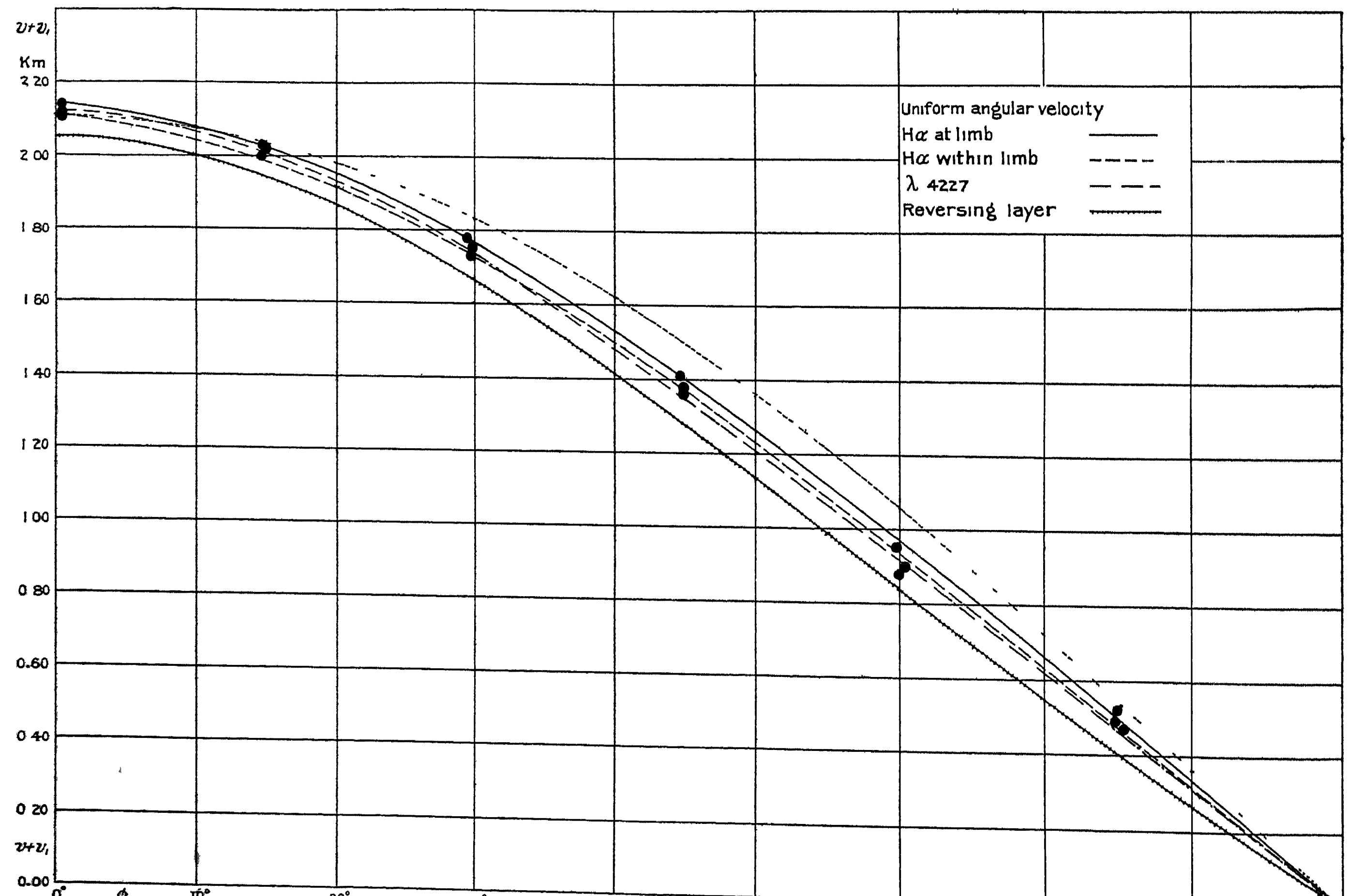


FIG 4 —Variation of radial velocity with heliographic latitude for the different lines observed The curve for the reversing layer is from the mean results for the two series of observations The radial velocity curve of a body rotating uniformly with a motion of 15°0 a day is added for comparison

19. Comparison of Results from all the Lines Investigated.

A remarkable feature of the results for λ 4227 and the two series on the *a* line of hydrogen is the sudden increase in angular velocity between 60° and 75° of latitude Too much stress should perhaps not be laid upon this, since in high latitudes the angular velocity is extremely sensitive to small differences in linear velocity, and with lines as difficult of measurement as these the entire effect could readily be laid to this source A change of 0 018 km at 75°, for example, would reduce a value of ξ of 14°0 to 13°5 A similar effect, however, was found for the lines of lowest level in the reversing layer, the lines of lanthanum and cyanogen giving exceptionally large deviations in the higher latitudes and in directions opposite to those found for these high-level lines Accordingly, there seems to be a slight presumption in favor of the existence of some cause toward the pole of the sun which tends to make the deviations from the mean exceptionally large for such lines as give abnormal values

The results for the two series of observations on *Hα*, for λ 4227, and for the reversing layer are shown graphically in Fig 4 The fifth curve, indicated by a dotted line, represents the curve of linear velocity of a body rotating with the uniform angular velocity of 15°0 a day It is, of course, the ordinary cosine curve.

In conclusion, it will be of interest to give a graphical representation of the results found in this investigation for all the lines studied Accordingly, I have collected the formulæ which represent the solution by least squares of the values of the angular velocity obtained for the reversing layer, *Hα*, and λ 4227, and

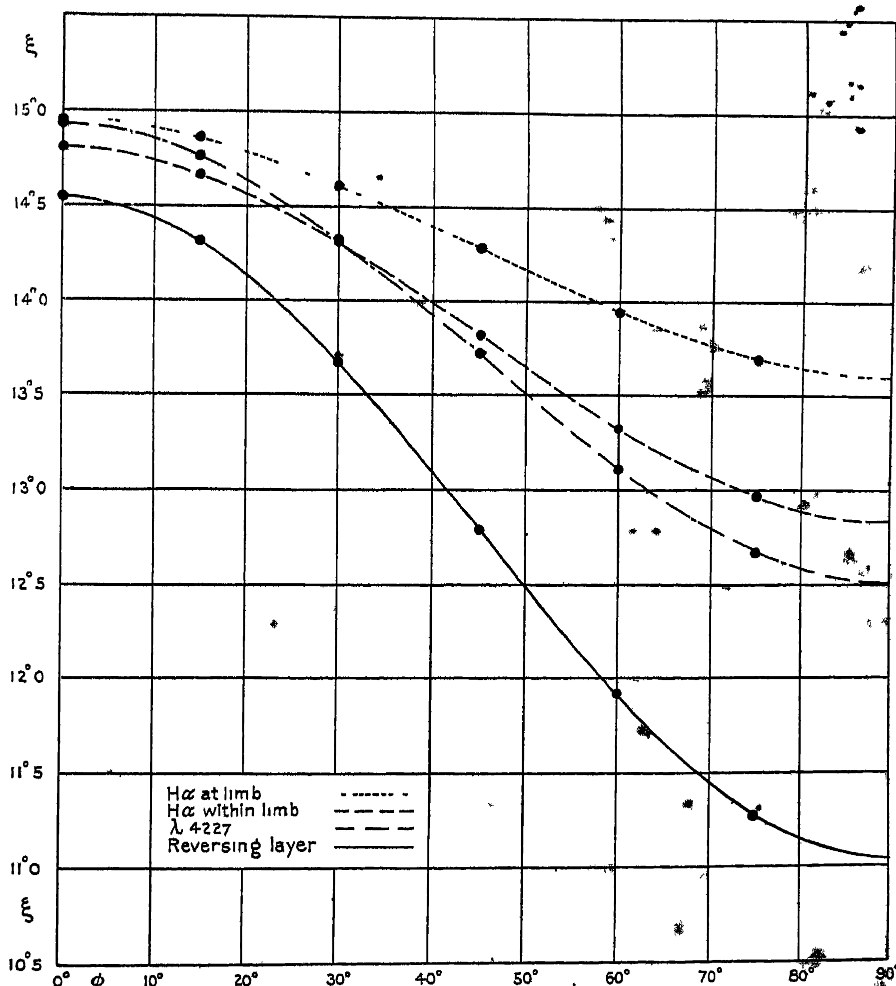


FIG 5 — Curves representing the values of the angular velocity given by the empirical formulæ derived from the observations of *Hα*, λ 4227, and the reversing layer. For the last named the mean of the two series of observations is used

have plotted the results for latitudes 0° to 75° in Fig 5 The formula obtained from the mean results for the two series of observations has been employed for the reversing layer

Reversing layer	$\xi = 11^\circ 04 + 3^\circ 50 \cos^2 \phi$
λ 4227	$\xi = 12\ 5 + 2\ 4 \cos^2 \phi$
Ha (within limb)	$\xi = 12\ 8 + 2\ 0 \cos^2 \phi$
Ha (limb)	$\xi = 13\ 6 + 1\ 4 \cos^2 \phi$

The numerical values of the angular velocity resulting from these equations are shown in Table 37 for every 15° of latitude The values given for the pole are extrapolations based on the formulæ, and are, of course, subject to great uncertainty An investigation of the region between latitude 75° and the pole undertaken with powerful apparatus would prove of great value in deciding many questions connected with the law of the sun's rotation

TABLE 37 —FINAL RESULTS FOR THE ANGULAR VELOCITY

ϕ	REVERSING LAYER	λ 4227	*Ha* (INSIDE LIMB)	*Ha* (LIMB)
°	°	°	°	°
0	14 54	14 9	14 8	15 0
15	14 31	14 8	14 7	14 9
30	13 67	14 3	14 3	14 6
45	12 79	13 7	13 8	14 3
60	11 92	13 1	13 3	13 9
75	11 27	12 7	13 0	13 7
Pole	(11 04)	(12 5)	(12 8)	(13 6)

20 GENERAL SUMMARY

The principal results of this investigation may be summarized as follows:

1 Two series of observations of the rotation of the sun made during 1906–1907 and 1908 give results agreeing closely with one another in latitudes 0° to 50° Above 50° the 1908 observations give smaller values, the greatest difference being at 70° and amounting to about 0 039 km

2 These differences are probably to be ascribed to small systematic errors in the earlier series of observations arising from the character of the solar image They may possibly be ascribed in part to proper motions in the sun's reversing layer

3 The evidence from these results is opposed to the existence of a variation in the sun's rate of rotation, unless the variation be of long period Not only is there no appreciable difference between the two series of observations in the lower latitudes and the regions of greatest spot activity, but the agreement of the 1908 results with the values of Dunér make a variation during the interval very improbable

4 Both series of observations agree in showing that the lines of different elements give different values of the rotational velocity Lines of lanthanum and cyanogen give low velocities These elements are known to lie at low levels in the solar atmosphere Certain lines of manganese and iron give high velocities

5 Lines which give systematically large or small values of the velocity appear to give the largest deviations from the mean in high latitudes

6. The 1908 observations are satisfactorily represented by an empirical formula of the Faye type The 1906–1907 observations show a tendency to systematic residuals with an equation of this form, and require the addition of another term for adequate representation The combined results for the two series are very closely represented by the formula

$$\xi = 11^\circ 04 + 3^\circ 50 \cos^2 \phi$$

7. The fact that these observations, as well as those of Dunér and Halm, are satisfied by the Faye equation indicates that this represents with a considerable degree of accuracy the law of the sun's rotation to within 10° of the pole.

8. A comparison of the probable errors of the 1906–1907 observations with those of the 1908 series indicates a marked gain in accuracy for the latter. The results for both series appear to show a decided superiority for the photographic method over the visual so far as the degree of accuracy is concerned.

9. The displacements of the spectrum lines may be influenced seriously by proper motions of the reversing layer. These may be very large in the neighborhood of the disturbed regions which are usually associated with sun-spots. A value amounting to 0.2 km has been observed in one such case. It is most important that in observations of the rotation of the sun such regions should be avoided so far as possible.

10. A study of the *α* line of hydrogen shows that the gas producing this line moves at a much more rapid rate than the general reversing layer, and that the change of angular velocity with increasing latitude is very much less. At the equator the difference from the reversing layer is about 0°.5, while at 75° of latitude it amounts to over 2°.5.

11. The results for the angular velocity obtained from *Hα* at a short distance inside the limb are appreciably smaller than those for the line at the limb. This is probably due to the lower average level of the gas involved in the formation of the line within the limb.

12. The line λ 4227 also gives decidedly larger values of the rotational velocity than do the lines of the reversing layer. The values are, however, smaller than for *Hα* at the sun's limb, and not far from equal to those for *Hα* within the limb. The equatorial acceleration is considerably greater for λ 4227 than for *Hα* at the limb.

13. The observations on both *Hα* and λ 4227 appear to indicate an increase in the angular velocity near the sun's pole. This is the converse of the result found for the lines of the reversing layer which give abnormally low values, and may perhaps be a genuine effect.

14. The comparison of the results on *Hα*, λ 4227, and the lines of the reversing layer shows that the observations are all satisfied by a law of rotation in which the velocity increases and the equatorial acceleration decreases with increasing distance outward from the sun's surface. The cause of this probably lies in the effects of friction in the lower portions of the solar atmosphere.

15. Comparison with the results for sun-spots, faculæ, and the calcium flocculi gives the following sequence in order of decreasing equatorial acceleration: spots and faculæ, λ 4227, calcium flocculi, *Hα*. The reversing layer, however, shows a greater amount of equatorial acceleration than any of these. If we assume, in accordance with Wilsing's theory, that there are two surfaces of constant angular velocity in the case of a rotating body such as the sun, it is possible that the reversing layer may lie in the position where the departure from this condition is a maximum. On this basis the spots and faculæ, which lie near the inner surface of uniform velocity, and λ 4227, the calcium flocculi, and *Hα*, which lie nearer the outer surface, would all show less equatorial acceleration.

I am under the greatest obligation to Mr. Hale for many suggestions during the progress of this investigation and for a deep interest in it. Among the numerous advances in solar spectroscopy made possible by his design and construction of the tower telescope is to be included the marked gain in accuracy of the later series of observations of the rotation of the sun. I am also greatly indebted to Miss Lasby and to Miss Waterman, of the Computing Division, for aid in the measurement and reduction of the plates. The measurement of many of the plates has been carried out by Miss Lasby alone, and a large part of the great labor involved in their reduction and in the solution of the empirical formulæ has been divided between Miss Lasby and Miss Waterman.

BIBLIOGRAPHICAL REFERENCES.

1 VOGEL, "Spectralanalytische Untersuchungen an der Sonne," *Astronomische Nachrichten*, **78**, 248, 1872

2 YOUNG, "Observations on the Displacements of Lines in the Solar Spectrum caused by the Sun's Rotation," *American Journal of Science*, Third Series, **12**, 321, 1876

3 LANGLEY, "A proposed New Method in Solar Spectrum Analysis," *American Journal of Science*, Third Series, **14**, 140, 1877

4 CORNU, "Notice sur les Raies Telluriques du Spectre Solaire et en particulier sur le Groupe α," *Bulletin Astronomique*, **1**, 74, 1884

5a DUNÉR, "Recherches sur la Rotation du Soleil," 1891

5b DUNÉR, "Uber die Rotation der Sonne, zweite Abhandlung," *Nova Acta Regiæ Societatis Scientiarum Upsaliensis*, Series 4, **1**, No 6, 1906

6 "Mr Jewell's Researches on the Solar Rotation," *Astrophysical Journal*, 4, 138, 1896

7 CREW, "On the Period of the Rotation of the Sun as Determined by the Spectroscope," *American Journal of Science*, Third Series, **35**, 151, 1888, **38**, 204, 1889

8 HALM, "Spectroscopic Observations of the Rotation of the Sun," *Transactions of the Royal Society of Edinburgh*, **41**, Part I, No 5, 1904

9 HALM, "Ein Beitrag zur Bestimmung der Rotation der Sonne," *Astronomische Nachrichten*, **173**, 294, 1907

10 ADAMS, "Spectroscopic Observations of the Rotation of the Sun," *Contributions from the Mount Wilson Solar Observatory*, No 20, *Astrophysical Journal*, **26**, 203, 1907

11 ADAMS, "Spectroscopic Investigations of the Rotation of the Sun during the year 1908," *Contributions from the Mount Wilson Solar Observatory*, No 33, *Astrophysical Journal*, **29**, 110, 1909

12 HALE AND ADAMS, "A Photographic Comparison of the Spectra of the Limb and the Center of the Sun," *Contributions from the Mount Wilson Solar Observatory*, No 17, *Astrophysical Journal*, **25**, 215, 1907

13 HALE AND ADAMS, "Second Paper on the Cause of the Characteristic Phenomena of Sun-Spot Spectra," *Contributions from the Mount Wilson Solar Observatory*, No 15, *Astrophysical Journal*, **25**, 75, 1907

14 HALE, "Solar Vortices," *Contributions from the Mount Wilson Solar Observatory*, No 26, *Astrophysical Journal*, **28**, 100, 1908

15 ADAMS, "Preliminary Note on the Rotation of the Sun as Determined from the Displacements of the Hydrogen Lines," *Contributions from the Mount Wilson Solar Observatory*, No 24, *Astrophysical Journal*, **27**, 213, 1908.

16 HALE, "The Tower Telescope of the Mount Wilson Solar Observatory," *Contributions from the Mount Wilson Solar Observatory*, No 23, *Astrophysical Journal*, **27**, 204, 1908

17 PÉROT, "Sur la Rotation du Soleil," *Comptes Rendus*, **147**, 340, 1908

18 EVERSHED, "Solar Eclipse of 1900, May 28 — General Discussion of Spectroscopic Results," *Philosophical Transactions*, A, **201**, 457, 1903

19 HALE AND FOX, "The Rotation Period of the Sun as Determined from the Motions of the Calcium Flocculi," *Publications of the Carnegie Institution of Washington*, No 93, 1908

20 HALE, "Preliminary Note on the Rotation of the Sun as Determined from the Motions of the Hydrogen Flocculi," *Contributions from the Mount Wilson Solar Observatory*, No 25, *Astrophysical Journal*, **27**, 219, 1908

21 WILSING, "On the Law of the Sun's Rotation," *Astrophysical Journal*, **3**, 247, 1896

22 CAMPBELL, "The Wave-Length of the Green Coronal Line and Other Data resulting from an Attempt to determine the Law of Rotation of the Solar Corona," *Astrophysical Journal*, **10**, 186, 1899

23 HALE AND ELLERMAN, "On the Nature of the Hydrogen Flocculi and their Structure at Different Levels in the Solar Atmosphere," *Proceedings of the Royal Society*, A, **83**, 177, 1910

24 ADAMS, "An Investigation of the Displacements of the Spectrum Lines at the Sun's Limb," *Contributions from the Mount Wilson Solar Observatory*, No 43, *Astrophysical Journal*, **31**, 30, 1910